

DEPARTMENT OF FIRE PROTECTION
Faculty of Wood Sciences and Technology
TECHNICAL UNIVERSITY IN ZVOLEN



Vedecko-odborný časopis
Katedry protipožiarnej ochrany
Drevárska fakulta
Technickej univerzity vo Zvolene
Slovenská republika
// Scientific and expert journal
of the Department of Fire Protection
the Faculty of Wood Sciences
and Technology
the Technical University in Zvolen
Slovak Republic

Delta

číslo 21, ročník XI., rok 2017



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Katedra protipožiarnej ochrany

Drevárska fakulta Technickej univerzity vo Zvolene

Zabezpečuje vzdelávanie v študijnom odbore Záchrané služby v akreditovaných študijných programoch:

I. stupeň – bakalárske štúdium

- Protipožiarňa ochrana a bezpečnosť
dĺžka štúdia: 3 roky denná forma, 4 roky externá forma
akademický titul bakalár „Bc.“

II. stupeň – inžinierske štúdium

- Protipožiarňa ochrana a bezpečnosť
dĺžka štúdia: 2 roky denná forma, 3 roky externá forma
akademický titul inžinier „Ing.“

III. stupeň – doktorandské štúdium

- Protipožiarňa ochrana a bezpečnosť
dĺžka štúdia: 3 roky denná forma, 5 rokov externá forma
akademický titul philosophiae doctor „PhD.“

Má oprávnenia pre vykonávanie:

- odbornej prípravy špecialistov požiarnej ochrany,
- odbornej prípravy technikov požiarnej ochrany,
- odbornej prípravy preventívárov požiarnej ochrany obcí,
- základnej prípravy členov hasičských jednotiek.

Poskytuje odbornú poradenskú činnosť v protipožiarnej ochrane a bezpečnosti.

Organizuje vedecké a odborné konferencie, semináre a firemné dni.

Department of Fire Protection

Faculty of Wood Sciences and Technology
Technical University in Zvolen

It provides education in the study field Rescue Services in following accredited study programs:

1st degree – Bachelor study

- Fire Protection and Safety
Study length: 3 years full-time form, 4 years part-time form
Academic title bachelor “Bc.”

2nd level – Master study

- Fire Protection and Safety
Study length: 2 years full-time form, 3 years part-time form
Academic title engineer “Ing.”

3rd level – PhD. study

- Fire Protection and Safety
Study length: 3 years full-time form, 5 years part-time form
Academic title Philosophiae doctor “PhD.”

It has the authorisation to provide:

- Professional training of fire protection specialists;
- Professional training of fire protection technicians;
- Municipality fire prevention bodies;
- Basic training of fire brigades members.

It provides the expert advice on fire protection and safety.

It organises the scientific and professional conferences, seminars and business days.

Fire Protection, Safety and Security 2017

International Scientific Conference

CONFERENCE PROGRAMME

Wednesday

May 3rd, 2017,

9:30 – 18:00

Place and room: Congress Centre of the Technical University in Zvolen, Studentska Street. – Dormitory of the Ludovit Stur - “Stara menza”

9:30 – 10:30	Registration
10:30 – 11:00	Conference opening ceremony Rector of the Technical University in Zvolen speech President of the Fire and Rescue Service speech President of the Voluntary Fire Brigade SR speech
11:00 – 11:30	Presentation of the Department of Fire Protection – Past and Present
11:30 – 12:00	Ceremony associated with the valuation of prominent personalities
12:00 – 13:00	Ceremonial lunch
13:00 – 14:00	Speeches of the home and foreign co-operating institutions representatives
14:00 – 15:00	Invited speeches (chairman: prof. RNDr. Danica Kačíková, PhD.) Osvald, Anton: <i>Fire Protection of Wood</i> Balog, Karol: <i>Application of materials flammability parameters in practice - Myth and reality</i> Kelemen, Miroslav: <i>Security of SR and issue of securing protected interests</i>
15:00 – 15:15	Coffee break
15:15 – 16:15	Section 1: Fire Protection and Safety I. (Chairman: prof. RNDr. František Kačík, PhD., prof. Ing. Anton Osvald, CSc.)
	Coffee break
16:15 – 17:15	Section 2: Fire Protection and Safety II. (Chairman: prof. RNDr. Danica Kačíková, PhD., prof. Ing. Karol Balog, PhD.)

Thursday

May 4th, 2017

9:00 – 17:00

Place and room: Congress Centre of the Technical University in Zvolen, Studentska Street. – Dormitory of the Ludovit Stur - “Stara menza”

9:00 – 10:30	Section 3: Fire-fighting Equipment and Fire Tactics (Chairman: assoc. prof. Ing. Mikuláš Monoši, PhD., Mgr. Ing. Ivan Chromek, PhD.)
10:30 – 10:50	Coffee break
10:50 – 12:00	Section 4: Crisis management and crisis situations coping (Chairman: assoc. prof. Ing. Andrea Majlingová, PhD., Ing. Veronika Velková, PhD.)
12:00 – 13:00	Lunch
13:00 – 14:30	Admission of students of the Technical University in Zvolen to the Fire-fighters Guild
14:30 – 14:45	Coffee break
14:45 – 15:45	Workshop - New approach to fire and accidents investigation in conditions of Slovakia (Guarantor: Ing. Martin Zachar, PhD.)
15:30 – 15:45	Coffee break

Friday

May 5th, 2017

9:00 – 12:00

Place and room: Congress Centre of the Technical University in Zvolen, Studentska Street. – Dormitory of the Ludovit Stur - “Stara menza”

9:00 – 10:00	Demonstrative co-operative tactical exercise of IRS emergency responders
10:00 – 10:30	Coffee break
10:30 – 11:30	Seminar – Progressive methods of material fire-technical characteristics determination in fire engineering (Guarantor: prof. RNDr. Danica Kačíková, PhD., prof. Ing. Karol Balog, PhD.)
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Delta 21/XI, 2017

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SLOVO NA ÚVOD NA ČASOPISU / FOREWORD

Vážení čitatelia,

prípravili sme pre Vás nové číslo nášho časopisu, v poradí už 21. Začíname ním rok, v ktorom okrem práce budeme aj rekapitulovať v súvislosti s významnými výročiami, ktoré si pripomínáme na Katedre protipožiarnej ochrany Drevárskej fakulty Technickej univerzity vo Zvolene, ale aj na Technickej univerzite ako celku.

Redakčná rada časopisu je rozšírená o novú členku, doc. Ing. Andreu Majlingovú, PhD., pracovníčku KPO DF TU vo Zvolene. Pani docentka habilitovala na Akadémii policajného zboru v Bratislave v odbore Ochrana osôb a majetku. Je odborníčkou na oblasť krízového riadenia, aplikácie GIS a v neposlednom rade je aktívna v projektovej činnosti a spolupráci s praxou, s HaZZ. Okrem odborného prínosu pri zostavovaní tohto čísla časopisu treba vyzdvihnúť aj jej nasadenie pri riadení organizačného výboru konferencie, ktorú organizuje KPO pri príležitosti 20. výročia svojho založenia, ale tiež nevyčerpateľnú energiu, s ktorou urobila preklady všetkých príspevkov do časopisu. Pri zaraďovaní článkov do jednotlivých rubriík sme sa snažili podporiť slávnostnú atmosféru v súvislosti s výročím založenia Katedry protipožiarnej ochrany a organizáciou medzinárodnej vedeckej konferencie.

V časti *Vedecké a odborné články* zaradené abstrakty recenzovaných príspevkov z medzinárodnej vedeckej konferencie *Fire Protection, Safety and Security 2017*, ktorá sa uskutočňuje v dňoch 3.-5. mája 2017 na Technickej univerzite vo Zvolene.

Rubriku *Uskutočnené podujatia* sme venovali informáciám o vedeckých a odborných podujatiach, ktorých organizátorom alebo spoluorganizátorom je, alebo bola, Katedra protipožiarnej ochrany Drevárskej fakulty vo Zvolene.

Dobrovoľný hasičský zbor Technická univerzita vo Zvolene je predmetom príspevku zaradenom do rubriky *DPO*.

V časti *Štúdium a ďalšie vzdelávanie* sú podrobné informácie o akreditovaných študijných programoch všetkých troch stupňoch štúdia v odbore Záchranne služby na Technickej univerzite vo Zvolene ako aj o aktuálnych oprávneniach uskutočňovať základnú a odbornú prípravu.

Keďže v celom čísle časopisu sa skloňuje Katedra protipožiarnej ochrany Drevárskej fakulty vo Zvolene, rubrika *Predstavujeme Vám* je venovaná práve informáciám o nej.

Veríme, že aj v tomto čísle si nájdete zaujímavé príspevky, ktoré budú podnetom pre ďalšiu spoluprácu s naším pracoviskom, KPO DF TUZVO.

Dear readers,

We have prepared for you a new issue of our journal, already the issue 21. With it, we begin a year in which, besides the work, we will also recapitulate the important anniversaries that we remind at the Department of Fire Protection of the Wood Faculty of the Technical University in Zvolen, and also at the Technical University as a whole. The Editorial Board of the Journal is extended by a new member, assoc. prof. Andrea Majlingova, PhD., an employee of the DPO FWST TU in Zvolen. She habilitated at the Academy of Police Force in Bratislava in the field of Protection of persons and property. She is a specialist in the area of crisis management, GIS applications and, last but not least, is active in project activities and cooperation with practice, with the Fire and Rescue Service. In addition to the professional contribution to the compilation of this journal issue, her involvement in managing the conference organizing committee, which is organized by the DFP on the occasion of the 20th anniversary of its establishment, but also the inexhaustible energy with which it has made translations of all contributions to the journal, should be highlighted.

When assigning articles to various rubrics, we have tried to promote the festive atmosphere in the context of the anniversary of the establishment of the Department of Fire Protection and the organization of an international scientific conference.

In the part "Scientific and Professional Papers", there are included the abstracts of peer-reviewed contributions from the international scientific conferences *Fire Protection, Safety and Security 2017*, which will be held on May 3rd to 5th, 2017 at the Technical University in Zvolen.

In the "Past Events" rubric we introduced information on scientific and professional events, where the Department of Fire Protection of Wood Sciences and Technology at the TU in Zvolen is, or was, the organizer or co-organizer.

The Voluntary Fire Brigade of the Technical University in Zvolen is the subject of a contribution included in the "*DPO, i.e. Voluntary Fire Protection*" rubric.

In the "*Study and Continuing Education*" rubric, there are the details of accredited programs of all three levels of study in Rescue Services study field at the Technical University in Zvolen and the current authorisation to perform basic and professional training.

Since in the whole journal issue is inclined the Department of Fire Protection of the Faculty of Wood Sciences and Technology at the TU in Zvolen, the rubric "*We Introduce*" is dedicated to presentation of the right information about it.

We believe that you will find interesting contributions also in this issue, which will be the reason for further cooperation with our workplace, DFP FWST TUZVO.



PROTIPOŽIARNA OCHRANA A BEZPEČNOSŤ 2017 FIRE PROTECTION, SAFETY AND SECURITY 2017

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FIRE PROTECTION AND SAFETY

Benedik, V.: **Fire resistance of wooden materials and its improvement by means of protective agents.**

The aim of this work was to experimentally verify the resistance of wooden materials with and without the use of protective agents. Research verified the ability of wooden material to resist point heat source for the period of 70 minutes with the use of protective agents and without them. To verify the assumption that the protective agents improve the fire resistance of given material, the temperature on the surface and inside the sample, weight loss over time, accompanying phenomena (formation of smoke, ignition) and external macroscopic manifestations (carbonization, formation of cracks) were recorded. The results support the argument that protective agents increase fire resistance. In the discussion, the data and observed phenomena are compared with the results of other surveys. In conclusion, the pros and cons of increasing the fire resistance of materials by individual preparations are evaluated.

Keywords: weight loss, protective agent, retarder, heat flow, heat, temperature

Čabalová, I., Zachar, M., Majlingová, A.: **Characterisation of thermally loaded wood species in the view of physical-chemical and fire-technical properties.**

This paper describes chemical changes of five fast-growing species, willow (*Salix viminalis* L.), acacia (*Robinia pseudoacacia*), poplar (hybrid) (*Populus nigra* x *P. maximowiczii*), alder (*Alnus glutinosa* L.) and birch (*Betula pendula* Roth.) with dimensions of 20 × 20 × 10 mm after thermal loading (ignition and flash point temperature). For each of them content of cellulose, hemicelluloses, holocellulose, lignin, extractives were rated. From the point of physical property we followed fibre's characteristics (fibres length, width and shape factor). After the thermal loading of the samples we observed an increase in the amount of cellulose, probably due to changes in its structure, and lignin because of the effect of greater thermal stability as well as due to its condensation. Conversely content of holocellulose decreased (approx. 20%) at all of used wood samples. Because of thermal degradation of wood increasing of fibres in shorter fractions is visible. From fire-technical properties point of view we can state that the acacia is the most resistant wood species in terms of thermal loading, and it is due to its wood density.

Keywords: ignition and flash point temperature, thermal wood degradation, chemical composition, fibres length, fast-growing species

Dúbravská, K., Mózer, V., Tereňová, L.: **A proposed mid-scale test for evaluation of vertical construction elements.**

Fire resistance is expressed by limit states and classification times. To determine these, the construction element must undergo specific tests in accordance to the relevant standards. The proposed mid-scale test method is considered a mid-scale method, by which vertical construction elements can be evaluated from the fire-resistance point of view. The basis of the proposed mid-scale test comes from STN EN 13501-2 and linked standards. The paper provides a theoretical background and describes the individual parts of the test apparatus, test conditions, description of the test specimen, test methodology and principles of evaluation of the limit states – thermal insulation and integrity.

Keywords: fire resistance, mid-scale test, vertical construction element, integrity, thermal insulation, standard time-temperature curve

Epifancev, K., Nikulin, A., Mračková, E.: **Improvement of the reliability and safety of extrusion machine operation when forming multi-component raw materials.**

The article focuses on the study of the technical and structural characteristics of extrusion machines used to make multi-component waste, RDF (refuse derived fuel). It outlines the results of DEM analysis enabling to forecast the behaviour and volume distribution of multi-component material particles in the extruder to maintain the rational value of ceramic heating element temperature, optimise the speed of auger rotation, reduce emergency shutdown and extruder clogging, and prevent potential ignition of extrusion machine elements. It presents the results of the simulation done in YADE software for the distribution of particles freely leaving the hole. The particles with higher adhesion were established to stick to extrusion machine walls, while less adhesive particles are located in the centre ready to leave the extruder. ROCKY DEM software was used to model the machine body frame and particle movement inside the casing. Simulation results confirmed the need to adjust the auger heating temperature in given points as well as current gauge-assisted control. It was found that uniform heating to 400 °C did not yield positive results. The experiments completed and computer models provided information on local heating sites in the extruder and the need to control a heating temperature. Research results were used to upgrade MH-3 experimental extruder by integrating controlled ceramic elements for mixture heating and heating temperature control gauges. These enhancements improved the quality of finished products.

Keywords: DEM of simulation, movement of particles, adhesion, clogging, auger, extrusion, parameters, automatics, thermal gauges, extrusion machine, municipal solid waste

Gašpercová, S., Makovická Osvaldová, L., Kadlicová, P.: Additional thermal insulation materials and their reaction on fire.

The internal lining is in building mainly used for decorative purposes, but its properties can mean some protecting load-bearing wooden structures from the effects of fire. With flammable Suspended floors belong to the permanent fire load. The aim of this work is to determine the reaction to fire coating the interior walls based on a representative sampling, recommend species and siding with the best desired properties of the reaction to fire, to evaluate the efficiency of using flame retardants.

Keywords: flame retardants, wood panelling, reaction to fire, Scots pine

Gergel, T. et al.: Potential of recycled fabric utilisation in terms of fire protection and acoustics.

The separating constructions used in construction industry must meet the structural, fire safety and acoustic parameters. For measurements, there were used nine different STERED® construction boards made from recycled textile, where it is envisaged the possibility of its use in the separating constructions. The paper deals with the thermal degradation of the samples of selected materials which are loaded with heat radiation of infrared heater with power of 1000 W for 10 min, and with determining the sound reduction coefficient (NRC) of selected materials by Kundt tube with diameter of 100 mm. The paper was aimed to quantify the thermal degradation of STERED® products testing their weight loss and to determine the sound reduction coefficient (NRC). Based on the information obtained in experiments, there was determined the most suitable material, as from acoustic as from fire safety point of view (Senizol AT XX2 TL 60 - a weight loss of 1.4%; NRC 0.81), which will be subjected to further testing.

Keywords: recycled textile, thermal degradation, mass loss, NRC – noise reduction coefficient, Kundt tube

Hlavička, V., Lublůy, É.: Load bearing capacity of bonded anchors in thermally-damaged concrete.

In our paper we analysed the load bearing capacity of bonded anchors placed in thermally-damaged reinforced concrete. Our primary goal was to facilitate the reinforcing techniques of reinforced concrete structural elements damaged in fire events. For the tests, 8 mm diameter threaded rods installed with epoxy adhesive were used, with an embedment depth of 50 mm. Three levels of thermal loading (200, 300, 400 °C) were applied to the concrete specimens, with respect to the embedment depth. The compressive strength of the concrete specimens used in the tests was $f_c = 44.79 \text{ N/mm}^2$.

Keywords: fire, concrete, bonded anchors, residual behaviour

Holuša, J., Lukášová, K., Berčák, R.: Creating and using a forest fire database in the Czech Republic

We received database of fires in natural environment in years 2006-2010 from Fire and Rescue Services of Czech Republic. This database contains detailed data recorded for each fire. We examined this database and discard fires which were apparently out of forest. Modified database contains about 2,000 fires less than original list. It does mean that using of raw database in different public statistics is not suitable. The most of fires in unmodified database in years 2010-2015 contains exact coordinates of place of fire. Forest fires are distributed randomly. Up to now, we have not found any connection between initiation of forest fire and environmental variables.

Keywords: forest fire, Czech Republic, databases of forest fires

Horváth, J.: Close proximity and acceptable distances for selected high-capacity oil storage tanks.

In the paper, there are set out the close proximities for selected high-capacity tanks according to STN 92 0201-4 and specified acceptable distance which were determined according to the methodology used in the U.S. For these high-capacity tanks for storage of crude oil were calculated the following fire parameters: energy release rate in fire and the mean height of the flame in the fire. The calculated mean height of the flame values represented the input data to determine the close proximities according to STN 92 0201-4. An objective of research was to determine and compare the acceptable distances for persons and structures in accordance to the U.S. methodology applied.

Keywords: mean flame height, close proximity, high-capacity storage tank

Chudová, D., Thomitzek, A., Trčka, M.: The temperature gradient in the soil during wildfire.

The article describes experimental measurements of the temperature field during a fire in the natural environment. Measurements carried out in cooperation with the National Park Brdy and FRS Pilsen region. Temperatures were measured to a depth of 20 cm below the surface and not more than 50 cm above the surface. For the measurement we used K thermocouples. Experimental fire took place on the area with Calluna. Measured values will be used for determination of the conditions for a controlled burn in order to maintain the stability of the ecosystem with Calluna.

Keywords: wildfire, fire, soil, temperature gradient, measurement

Iringová, A.: Impact of fire protection on the design of energy-efficient and eco-friendly building envelopes in timber structures.

Analysis of construction systems of timber structures according to their use in dependence of the fire height. Legislative limits. Optimization of tested building envelopes in terms of the energy consumption and environmental impact on the timber buildings in the context of fire protection requirements. Requirements for fire protection of tested structures and their optimization in terms of fire resistance.

Keywords: construction systems of timber structures, fire protection, legislative limits, energy efficiency, environmental impact, fire protection of tested structures

Korshunov, G., Nikulin, A., Kovshov, S., Mrackova, E.: Review of Dust Deposition and Dust Explosion Proofness in Mine Workings.

The article addresses the key items of Russian, U.S., Australian, and European regulations that govern the dust explosion proofness system at coal mines. It contains the review of parameters of main aerotechnogenic processes in mine workings related to a dusting factor. The article reviews the impact of the following dust parameters on dust explosion proofness in a coal mine. They include dust concentration, lower explosive limit, volatile yield, ash content, rock moisture content, coal wettability, and distribution of dust particles in a dust cloud. Dust particles sized up to 831 μm (1,000 μm) at blast wave speeds of 335 to 435m/s or higher are demonstrated to be capable of being suspended and involved in explosions. An important indicator governed by applicable Safety Rules During Coal (Shale) Enrichment and Pelletising is a rock dusting standard which means the lowest non-combustible content when coal dust mixed with inert one does not explode. The article lists key measures aimed at mitigating a dust explosion probability at a mine. Mine working rock dusting is proposed as the most efficient technology to reduce dust release and promote dust explosion proofness. Rock dusting involves adding inert dust to make a mine working explosion-safe. The article presents methods to determine such additives in Russian and U.S. mines. Rock dusting standards were calculated for the coal mines in the Kuznetsk Basin. Results were compared with the relevant indicators for U.S. and Australian mines. The shale dust with a weight of 2.41kg/m was established to entail inert dust distribution in a 80–150 μm layer when distributed across a line metre of the mine workings (covered area of 15 to 20m²), however there are almost no technologies to implement this. Rock dusting frequency is based on a dust deposition intensity review.

Keywords: dust, dust generation, dust explosions, rock dusting, explosive limit, coal, mine, dust explosion proofness

Martinka, J., et al.: Prediction of wood and wood-products behaviour under real fire conditions.

Presented paper deals with the description of methods used in prediction of time to flashover and reaction to fire class of wood and wood products. Described methods have been applied to prediction of time to flashover and reaction to fire class of selected wood. All described methods predicted the time to flashover and reaction to fire class from data measured by the cone calorimeter according to testing procedure in accordance with ISO 5660-1:2015 at heat flux of 50 kW. m⁻². Majority of described methods calculate the time to flashover also from the density of the sample in addition to data measured by the cone calorimeter. Samples of White Birch wood (*Betula verrucosa* Ehrh.) with dimensions of 100x100x20 mm were investigated. The samples were dried at temperature of 103 \pm 2 °C to water content of 0 wt% prior to testing on the cone calorimeter. The density of investigated samples (at water content of 0 wt%) was 558.4 \pm 12.2 kg m⁻³. The calculated time to flashover of investigated birch wood lied in interval from 120 s to 600 s in most cases of used methods. The predicted reaction to fire class of investigated birch wood was C.

Keywords: Cone calorimeter, fire investigation, fire risk, flashover category, flashover prediction, reaction to fire prediction, time to flashover, White Birch wood

Maslak, M., Pazdanowski, M., Wozniczka, P.: Impact of the limited oxygen availability on the localized fire development in a large-area building compartment.

The numerical modelling results of a localized fire are presented in this paper. Such a fire may develop in a fire compartment having large area and relatively low height. It was assumed, that neither smoke vents nor any other measures to facilitate the smoke extraction were installed in the considered fire zone. Under such circumstances the efficient ventilation is rather impossible, especially in the areas distant from the permanently open doors and windows. This limits the availability of oxygen, affecting the fire intensity. The modelling was performed using the FDS computer program. The development of potential fire with three different fire origin locations was considered. The considered locations differed in the distance to the existing ventilation openings and to the external walls delimiting the fire compartment. The obtained results, and especially the distributions of maximum temperature in the smoke plume specified in the selected cross sections of the analysed zone were compared with the temperature distributions estimated based on the analytical models recommended in the professional literature. The comparison is complemented by the thermal maps illustrating the specifics of the forecast fire development in the boundary zone near the walls.

Keywords: localized fire, fire modelling, ventilation conditions, oxygen availability, fire suppression, exhaust gas temperature

Mitterová, I., Zachar, M., Majlingová, A.: Effect of flame retardants on selected fire parameters of spruce wood.

The paper deals with the issue of the protection of wood. It brings the results of experimental works focusing the assessment of the chemical substance with fireproof function application effect on the thermal resistance of spruce wood. The experiments results show the change in effect of the protective substance at varying concentration and method of application (coating, retting), and thus also the different values of observed variables (weight loss, time of ignition) of tested spruce samples.

Keywords: wood, coating, retting, flame retardant, weight loss, time of ignition

Mojžiš, M., Zachar, M., Kačíková, D.: Comparison of the effectiveness of sorption materials for a variety of lubricants and their applicability.

One of the negative effects, from the environmental point of view, is the leakage of crude oil hydrocarbon products, whether it is negligent act or an accident. As a precautionary measure or intervention, there are used the different types of sorption materials. In this paper, there were investigated the sorption materials in bulk form, as a result of their quantitative use. The samples were selected for their common use in the Fire and Rescue Service or in the private sector in Slovakia (3mon, Absodan plus CANSORB, Chezacarb, expanded perlite, PeWaS Sorb, Reo sorption pulp and Spilkleen plus). The sorbents were tested for sorption capacity hydrophobicity, space and mass complexity. Selected sorbents samples were tested for various types of operating fluids such as motor, gear and hydraulic oils. The sorption capacity was measured in accordance to the standard test method to determine the sorption properties of adsorbents in the short term. The measurement showed that the best average sorptive capacity has Reo sorption pulp with value of $16.85 \text{ g}\cdot\text{g}^{-1}$ treated with a hydrophobic treatment. As the most compact sorbent, there was the PeWaS Sorb, with sorption capacity of $1003.35 \text{ l}\cdot\text{m}^{-3}$, determined.

Keywords: Sorbent, hydrocarbon lubricants, sorption capacity

Mračková, E., Tureková, I.: Determination of selected fire-technical and safety characteristics of food dusts.

The goal of the paper is determination of selected fire-technical characteristics of food dusts. Selected samples are processed in the food processing industry and in the agriculture in mills which are dusty technologies and there exists a real risk of fires and explosions. We put samples of dust particles of the smooth wheat flour and corn starch to the sieve analysis, thermal analysis by determination of TG (thermogravimetry) and DSC (Differential Scanning Calorimetry) and next measurement was determination of minimum ignition temperature of swirled and settled dusts. Experiments have confirmed that both samples of food dusts are similarly flammable and explosive because of their fire-technical and safety characteristics, so it is necessary to observe fire prevention and provide protection against explosion to the technology.

Keywords: food dusts, corn starch, wheat flour, sieve analysis, thermogravimetric analysis, settled dust, swirled dust

Nejtková, M.: Use of 3D laser scanning system for using during fire investigation.

The paper deals with the utility of 3D laser scanning system at the scene of the fire. This is a relatively new and progressive method of documenting and digitizing location of the fire seat. The output is very detailed pictorial and surveying, topographic documentation, including a record in the infrared spectrum. Outputs can be further implemented to fire technical expert.

Keywords: 3D documentation, search, fire and technical expertise, seat of the fire, scanning, investigating causes of fire

Nikulin, A., Epifancev, K., Mračková, E.: Research of the methods to enhance extrusion pellet machine performance by using automated load controls and its safety.

The annual municipal solid waste (MSW) generation in Russia totals 55 to 60 million tons [1] with an average of up to 400kg of waste per person per year. The growth of waste generation is closely associated with increasing welfare of the society, which means that there is a correlation between GDP per capita and per unit generation of waste. Lack of appropriate measures might result in a substantial environmental footprint in the MSW sector. Waste recycling in Russia merely reaches 5% to 7% versus up to 60% of MSW in Slovak Republic and EU, and over 90% of waste in Russia is delivered to waste landfills and unauthorised dumps so that waste accumulation is increasing [2]. This environmental situation is a national priority. The Decree of the President of the Russian Federation dated 5 January 2017 announces 2017 the Year of Ecology in Russia. Most environmental reforms stipulated by amendments to laws are enacted from 1 January 2017. These are primarily measures aimed at emissions and discharges control using best available technologies and breakthrough provisions of the Industrial and Consumer Waste law [3]. The Clean Country, priority project of the Russian Government, will be implemented from 2017 to 2025 with the key aim of reducing the environmental footprint from municipal solid waste disposal and mitigating environmental risks of an accumulated environmental damage [4]. The priority project involves the construction of five environment-friendly facilities for the thermal processing of municipal solid waste (waste incineration plants), four of them to be built in the Moscow Region and one facility to be built in the Republic of Tatarstan. An alternative to waste incineration is municipal waste recycling

by moulding in extrusion machines to make pellets to be further used in the fuel or construction industries. The profitability of a waste recycling facility is dependent on a sound choice of extrusion equipment with the best value for money [5].

Keywords: Extrusion machine, clogging, auger, matrix, palletising, feed, moulding parameters, automatics, gauges, pressure

Oravec, M., Vargová, S., Rusnák, O., Kotianová, Z.: **Intermediate ceiling board - risk element of road tunnels.**

Tunnels are significant constructions of the road infrastructure. The tunnels in Europe put into operation at the beginning of the second half of the 20th century were designed in time when technical possibilities and traffic conditions were different as today ones and so various levels of safety in tunnels in East, North and West Europe exist. The aim of this paper is to highlight the fire safety of long road tunnels and motorways, ventilation system of which is semi-transverse or transverse. These tunnels are structurally designed with intermediate ceiling board separating the driving space from the ventilation duct. In case of fire, the intermediate ceiling is a critically thermally stressed structure. Maintaining the stability and integrity of the intermediate ceiling has a direct impact on the functionality of the ventilation tunnel.

Keywords: road tunnel, fire, ventilation

Orémusová, E.: **Evaluation of upholstery fabrics ignitability.**

The paper deals with the assessment of ignitability of selected upholstery fabrics used in the upholstered furniture and upholstery products, which belong among the combustible organic polymers. Upholstery fabrics are grouped into three sets, based on the origin of the fibres as a basic structure unit of fabrics. There were tested fabrics from natural fibres: herbal - cotton, animal - wool; chemical fibres: natural polymers - viscose, synthetic polymers - polyacrylonitrile, polyester, polypropylene; mixed fabrics - in specific percentage of chemical and natural fibres mixture, while the fabrics had different weight and moisture basis. Two fabrics were flame retardant treated and one with anti-soiling treatment. The ignitability was represented with the flash point temperature, ignition temperature, and the time to ignition, which belong among the fire characteristics in accordance to standardized test methods introduced in the standard EN 871. Flash point temperature ranged from 240 ° C (cotton) to 430 ° C (wool with the Scotchard anti-soiling treatment), the time to ignition was in range from 159 s (cotton) to 587 s (retardant treated polyester), the ignition temperature was in range from 360 ° C (retardant treated fabric 50% polyester / 50% polypropylene) to 530 ° C (wool with the anti-soiling treatment), the ignition time was in range from 32 s (polyacrylonitrile) to 438 s (retardant treated polyester). The retardant coating affected mainly the times to ignition. In addition, there was analysed the relationship between temperatures, times and the weight and moisture basis. The dependence has been shown to be statistically significant only for the fabrics set made from natural fibres of cotton and wool.

Keywords: upholstered furniture, upholstery fabrics, flash point temperature, ignition temperature, time to flash point, time to ignition

Osvald, A.: **Wood fire protection**

The issue of wood burning has become a subject of interest to many institutions and personalities. Wood burning issue, for the needs of fire protection, can be defined in several separate areas. One of them, the first, is testing of materials and their behaviour in burning conditions. The second is the investigation of wood properties (humidity, density, wood texture, surface finish, and others) effect on burning. The third area is retardant treatment of wood and evaluation of the effectiveness of flame retardants and the quality of retardant treated material. The fourth is the safe use of wood and wood-based materials in wooden constructions.

Keywords: burning, fire protection, wood, wood-based materials, wooden constructions

Pokorný, J., Malerová, L.: **Fire plume characteristics and their application in assessment of a local fire.**

The paper defines local fire and its specific part (vertical section) which is the vertical smoke column called a Fire Plume. The paper presents a general description and detail of Fire Plume classification. Further, Fire Plume characteristics are described which can be divided into general and others. The general characteristics of the Fire Plume, which include geometry, temperature, flow speed and volume of smoke gases, are further detailed in relation to determining their average, minimum, maximum, axial or radial values. The discussion includes two methods for determining the said characteristics, particularly with respect to the extensive scope of methods often providing variant results. The characteristics of a Fire Plume enable a relatively detailed description of numerous parameters of a local fire and can be used in various applications for assessing the effects of a fire during the development stage.

Keywords: fire development, local fire, Fire Plume, characteristics, fire safety of structures

Rantuch, P., et al.: **Calculation of critical heat flux for ignition of oriented strand boards.**

Critical heat flux is one of the key properties characterizing the ignition of the materials. It provides quantitative data, showing the rate of energy transfer in the form of radiation required for the ignition of sample. The article deals with determination of this property for dried

oriented strand boards (OSB), which is one of the widely used wood-based materials. The samples were exposed to radiations from cone heater at six heat flux values: 15 kW.m⁻², 20 kW.m⁻², 25 kW.m⁻², 30 kW.m⁻², 35 kW.m⁻², 40 kW.m⁻². Volatile flammable substances were ignited by electrical spark ignitor. Critical heat flux was calculated from measured times to ignition of samples. Five types of methods that use critical heat flux related to time to ignition in an endless scenario, and three restrictive times to ignition of sample to a specified value were used. The results of the first five methods reached an average value of 5.91 kW.m⁻². In the case of specifying the exact time restriction, the critical heat flux significantly changed over this time in the range from 7.82 kW.m⁻² to 13.16 kW.m⁻².

Keywords: critical heat flux, burning, OSB, cone heater, ignition

Romanov, A., Nikulin, A.: **Safety improvement using transparent intelligent support systems for personal protective equipment.** Human organs and tissues may be damaged mechanically in the workplace in case of non-compliance with the safety rules or in an emergency. The article addresses the development of hardware solutions that will improve personal protective equipment used to protect the workers' head, namely a safety helmet. In accordance with the standard rules for the free issuance of personal protective equipment, a safety helmet should be worn by all employees in the workplace. It is therefore can be used as an element of a system connected to humans to form a "human–safety helmet system" which can be considered both means of safety and an information source. Recording, monitoring, and review of this information to track down the safe values of the factors in questions, as well as the integral assessment of safety will enhance the effectiveness of human safety in the industrial environment. Once combined, a man and a safety helmet form a biotechnical system (BST) that builds an information space opening up additional methods of improving employee safety. The article addresses the interaction between the environment and the "safety helmet–human" biotechnical system and describes the outlook of their interaction. The article defines the idea of "transparency" in view of system applicability for the user. The result of analytical and theoretical studies is the assessment of the long-term benefits of proposed solutions to form an integrated package ensuring the safety of employees wearing a safety helmet in different industrial environments.

Keywords: safety, personal protective equipment, safety helmet, biotechnical system, intelligent systems, occupational health and safety, transparency

Šuleková, M., Rantuch, P., Kačíková, D.: **Testing of selected types of polyurethane foams using the cone calorimeter method.** Polyurethane foams belong among the polymeric materials, the use of which is relatively wide. The most frequent form of their utilisation is filling of the upholstered furniture and mattresses. When they are set to fire and the subsequent burning, there occurs formation of the amount of toxic combustion products, which are often the cause of human death. Therefore, it is important to study these materials in terms of fire protection. In this work, we focused on four types of polyurethane foams: two standards types with different densities (N 3038, N 4050), highly elastic type (R 4036) and flame retardant covered polyurethane foam (FF 5740). Selected types were tested applying the ISO 5660-1-2002 cone calorimeter method. The samples were loaded with a heat flux of 20 kW.m⁻². There were obtained the parameters of the heat release rate, the total heat released, weight loss of the samples, and the rate of weight loss. The polyurethane foam with flame retardant cover withstood the load heat flux the longest. The value of a maximum heat release rate reached the lowest value.

Keywords: polyurethane foam, conic calorimeter, heat release rate, time to ignition of the sample, rate of weight loss

Tereňová, L., Gracovský, R.: **Impact of material composition on the fire safety of wood buildings structural elements.** Suitable material composition of structural elements of wood buildings has a significant impact on the capability of the structure to withstand the effects of fire. In this paper are evaluated the results of radiant heat source loading tests of two different supporting wall structure compositions. The test results showed that using the suitable background materials, there can be achieved the greater capability of fire protection of a structure and thereby to ensure that there will be no ignition of flammable materials inside the structure for some time and thus also no overall increase in the intensity of the fire. The best results were achieved by sample with OSB board underlying the plasterboard wall finish.

Keywords: wooden structure, design element, material composition, background materials, fire protection capability

Thomitzek, A., Chudová, D., Trčka, M.: **Heat flux density from diesel pool fire.** This article describes measurement of the thermal radiation near the pool with burning diesel fuel. Fire Brigade City of Prague held a tactical exercise focused on extinguishing burning diesel pool. This exercise was also carried out measurements of thermal radiation. For measurements using six water cooled radiometers in different distances from flames. In two experiments was ignited diesel oil on the area of 8 x 10 m. During of burning was measured and recorded heat flow density. Measured values of thermal radiation in the article are compared with values obtained by calculation.

Keywords: large diesel pool, heat flux, heat flux density, heat radiation

Vandlíčková, M.: Preventing a dust explosion at food processing plants.

Combustible dusts are composed from fine particles that can present a significant risk, especially with regard to their explosion. Under certain specific circumstances it may occur in food companies very quickly and damage that can be caused by such explosions, mostly climb to huge amounts. A dust explosion can be catastrophic and cause employee injuries and deaths. [1] In many cases the dust explosion can cause huge destruction of the entire building. Therefore it is important to pay attention to fire-technical characteristics of combustible food dusts to protect against emergencies as a result of the explosion. To avoid a dust explosion means taking measures to prevent such situation (dust explosion prevention) or there is possible to protect people, technology and buildings in case of dust explosion by designing facilities (explosion protection). The article deals with the chosen characteristics of combustible dusts, especially with the fire-technical characteristics, as well as with an explosion protection at food processing plants.

Keywords: combustible dust, flammable dust, food industry, fire – technical characteristics, dust explosions, explosion protection

Veřková, V. et al.: The formation of hazardous substances at the thermal loading of indoor polystyrene boards.

Styrene polymers have very adverse fire-technical characteristics. It is easy to ignite them, they burn quickly and combustion is attended by formation of large amount of heat and toxic volatile degradation products. The aim of the paper is to determine the formation of hazardous substances in the smoke arising at the thermal loading of indoor polystyrene boards using HeadSpace/Gas Chromatography/Mass Spectrometry (HS/GC/MS). The polystyrene samples were thermal loaded at the temperatures of 60, 80 and 100 °C in the HeadSpace sampler. We determined the mass and density changes and the arising gaseous products were analysed by Gas Chromatography with Mass Spectrometry. The formation of several compounds of polystyrene degradation was achieved already at the 60 °C. The main products were styrene, alpha methylstyrene, toluene, xylenes, ethylbenzene and other alkylated benzene derivatives. With increasing temperature increases quantity of gaseous products and amount of the main products.

Keywords: polystyrene, thermal loading, HeadSpace, Gas Chromatography, Mass Spectrometry, styrene, alkylated benzene derivatives

Vystrčil, V., Suchý, O., Bursíková, P.: Fire Research at Technical Institute of Fire Protection in Prague.

In the first part of this article there you can find description of Technical Institute of Fire Protection (TIFP). TIFP is a small institute in Prague, which consists of five departments. You can also find description of main activities of these departments. In the second part of the article there is description of our research projects. Currently we deal with 5 different projects. We started 2 projects in 2016 and 3 other projects in the beginning of this year. Because we are at the beginning of the projects our results are limited. Instead of the results we want to provide some information about our institute and about its activities to create some space for possible cooperation with other institutions, which deal with the similar topics as we.

Keywords: research and development, fire protection, CFD modelling, ladders, CNG, traces of fire on vehicles, fire rescue vehicles

Xu, Q., Majlingová, A., Zachar, M.: Evaluate fire behaviour of lining material under different irradiance heat flux using the cone calorimetry

Bench scale tests by Cone calorimeter were conducted to evaluate the fire behaviour of a vinyl based lining material with and without anti-corrosion painting. The samples were tested with two irradiance heat flux, 35kW/m² and 50kW/m². Östman/Tsantaridis' empirical linear regression model and Hansen/Hovde's multiple discriminant function analysis (MDA) were used in the predicting flashover time and classifying the lining material from the results of 50kW/m² tests.

Keywords: fire behaviour, lining material, cone calorimetry, flashover prediction

FIRE-FIGHTING EQUIPMENT AND FIRE TACTICS

Ballay, M., Monoši, M.: **Emergency response and safety fire fighter in relation to technologies used in electric vehicles.**

Paper refers to technology in the context of electric vehicles. A substantial part of the article focuses on the challenges which comes this new technology for the firefighter unit in case of an emergency. In the present article describes the fire-fighting activities and responds to a variety of security issues. The use of renewable energy in vehicles creates hazards which require new fire policies and procedures.

Keywords: electric vehicles, fire brigades, rescue operation, incident

Dermek, M., Monoši, M.: **Use of high-capacity pump for firefighting.**

The article talks about using a high-capacity pump Hytrans to transport water to large fires. It states fire statistic in Slovakia and defines when is appropriate to use the system Hytrans. It describes details of the system Hytrans, its basic parts, and the principle of activity and performance parameters. It concludes whether to use the system for extinguishing large fires and other emergencies.

Keywords: high-capacity pump, large fires, Hytrans pump, water transfer

Holuša, J., Lukášová, K., Berčák, R.: **Creating and using a forest fire database in the Czech Republic.**

We received database of fires in natural environment in years 2006-2010 from Fire and Rescue Services of Czech Republic. This database contains detailed data recorded for each fire. We examined this database and discard fires which were apparently out of forest. Modified database contains about 2,000 fires less than original list. It does mean that using of raw database in different public statistics is not suitable. The most of fires in unmodified database in years 2010-2015 contains exact coordinates of place of fire. Forest fires are distributed randomly. Up to now, we have not found any connection between initiation of forest fire and environmental variables.

Keywords: forest fire, Czech Republic, databases of forest fires

Chromek, I.: **Distance of water resources and their impact on long-distance transport of water to extinguish the forest fires.**

The paper deals with the issue of water resources in relation to shuttle water and relay pumping in extinguish the forest fires. Based on an example, there are discussed the possibilities of individual ways of water transport using the existing transport and capacity possibilities of fire-fighting equipment in Slovakia.

Keywords: Shuttle water and relay pumping, forest fire, water resource

Jánošík, L., Jánošíková, I., Monoši, M.: **Assessment of economic life of firefighting and rescue appliances based on chassis MAN TGM in the South Moravian.**

This paper is focused on the evaluation of economic data obtained from operational records of fire-fighting equipment with a focus on Firefighting and Rescue Appliance type of vehicles, especially on exit vehicles based on the chassis MAN TGM, during the period 2010 - 2015. These vehicles were operated by professional units of the Fire and Rescue Service of the South Moravian Region. The paper's aim is to specify the optimum lifetime of the fire-fighting vehicles by the marginal analysis of fire-fighting vehicles' economical operation. Theoretic calculations of the optimum lifetime have been processed with implementing both the method of exponential trends, and Brown method. The residual value of vehicles has been calculated both according to the current Czech tax law, and to the Expert Standard Valuation of motor vehicles in force in the Czech Republic.

Keywords: acquisition value; costs; depreciation; residual value; economic life

Monoši, M., Tomek, M.: **The analysis of the causes of accidents and technical support of the intervention activities in traffic accidents.**

The issue of traffic accidents is a serious social problem in all spheres of human activity. The members of the Fire and Rescue Service of the Ministry of Interior of the Slovak Republic are involved in resolving them in terms of saving people and property. Service of the Ministry of Interior of the Slovak Republic (HaZZ MV SR). The article deals in the first part with the legislation and factors affecting the operation of fire-fighting units of HaZZ MV SR. It also deals with analysis of the causes of accidents on the roads. An emphasis is laid on the analysis of intervention activity of units of HaZZ MV SR and on the forecast for the year 2020. In the next part of the article, technical support of intervention of fire fighters in road accidents is designed.

Keywords: traffic accidents, accident statistics, fire-fighters, extrication technology, intervention

CRISIS MANAGEMENT AND CRISIS SITUATIONS COPING

Ďurech, P., Sventeková, E.: **Process of organizations renewal damaged way interaction of extraordinary events in consideration of increase in security population.**

Article is geared on arbitration the present state organizations renewal way interaction damaged extraordinary events in the Slovak Republic. Extraordinary event occurring on homestays lands innumerable a lot of. From several statistic sources results, that in the Slovakia be featured causes damages way interaction flood. Additional often reasons damages be able to spring flood, wash under roads, slump. Boundary unique reasons belong earthquakes, snowy avalanches, terrorist attacks, industry accident damage, accident damage nuclear energy furnished and last but not least this be able to too military conflicts. Flood to our lands come into being mainly in the following extreme collision, vehement crease of temperature by the high supply snow in the trot round, storm rainfall collision by the storms, but also following strong crease of temperature by the frozen water - course. Individual these hazards can they endanger substantially attributes, environment, but also life and health nation. Processes organizations renewal damaged way interaction is safeguards depression the material loss on lands and life settings and of course too increase in safety population in the infliction of areas of extraordinary event. In the introduction article are described ground activities renewal the land interaction during extraordinary event. All needs information is draw from Methodical direction on realization furnished economic mobilization. Article further approaches single stage renewal damaged way interaction. In fine is characterized analysis by the organizations renewal damaged way interaction concerning increase in safety population on lands Slovakia's republic. Entireties process of are trained - in in brief patterns of, who particular point from this patterns of are dismantled to detail. She divided by is on two stage, who be also detailed specify. Examination too difficult of the process to loll against several individual areas of such as too by over predicamental planning and predicamental managing in Slovakia, who are dismantled in last two portions of hereof article.

Keywords: defective way interaction, special events, flood, safety of population, economic mobilization, Slovak Republic, organizations renewal, risks, crisis planning, crisis managing

Kelemen, M.: **Security of the Slovak Republic and the securing of protected interests**

The security and law research usually points out the "fight" against anti-social phenomena which is complicated, long, demanding, but also socially necessary for a healthy, satisfied and sustainable development of a democratic society: the security of the country and the security of the citizens, the protection of essential human rights and freedoms and the provision of other protected interests. The search and verification of new research and study ways is therefore an interesting agenda representing a permanent challenge for us. The feeling of responsibility for the future of the security and law community in the country forces us to undergo this process and to contribute to the solution by means of our small opus. The submitted designs and suggestions for a scientific discussion and purposes are the reflection of a new dimension of the development of the field of protection of interests identified within the context of a forming sub-group of the set of disciplines of science and technology in the Slovak Republic called the security and law disciplines.

Keywords: decision support systems, knowledge management, forestry

Lobo Ferreira, B.C., Restás, A.: **Mental health aspects of crisis management with real examples.**

Mental health can contribute to all stages of crisis or disaster management, specifically pertaining to vulnerability towards disasters during the prevention stage. This article shows the aspects of the Brazilian social structure, which make it vulnerable to the climatic events that affect the country. It endows itself with a sociological concept of disaster, which is defined by a disruptive event of social structure. In addition, it presents the structure of civil protection and mental health as part of management. The paper presents the natural disaster in the Mountainous region of Rio de Janeiro in 2011 together with the mental health work accomplished. Important aspects of mental health and good governance practices are pointed out in order to contribute to current strategies and assist in building effective plans. It is concluded that not only mental health professionals should invest in research and development of good governance practices, but organizations should include, in their structure, the findings and potentialities of mental health to deal with disasters and comply with the plan for more resilient societies. Plans like these should include the adequate preparation of the professionals who will work in-depth diagnostic assessment of the situation and consistent with the culture, just as the development of strategies for empowerment and creation of networks with the community.

Keywords: mental health, natural disasters, good governance, community-base, protection

Maipisi, A., Restás, A. Jordaan, A.: **Disaster risk reduction (DRR) interventions implementation challenges and successes: A discussion on Zimbabwe, South Africa and India.**

Zimbabwe, South Africa and India are developing countries. The first two countries are located in the southern part of Africa and India is in Asia. All nations embraced disaster risk reduction (DRR) as their new disaster risk management (DRM) approach although that was being

implemented differently in specific countries. They were also experiencing almost similar hazards with dissimilar extremities and disaster outcomes. **Methods:** An in-depth and extensive review of relevant literature was carried out. After that, findings were validated through discussions and circulation of results to appropriate authoritative citizens of relevant countries for comments which were subsequently incorporated to this paper. **Results:** The study revealed that Zimbabwe, South Africa and India were at different DRR implementation levels. Their approaches were customised to suit specific country's prevailing political, economic and administrative systems that resultantly, their DRR challenges and successes also varied. Hence, significant lessons can be drawn from the discussion.

Keywords: disaster risk reduction (DRR) interventions, disaster risk management (DRM) frameworks, fail-safe communication, Zimbabwe, South Africa, India

Majlingová, A., Buzalka, J.: Crisis management based on GIS – Case study.

In the paper we introduce the particular GIS environment and tools to be used together with recently developed methodologies to support the decision process of crises managers at local level. We applied those tools and methodologies for the area of Banská Bystrica district, Slovakia. The analyses are focusing risk and risk components assessment, in particular the susceptibility, vulnerability and resilience to flood, wildland fire and release of chemical dangerous substance. Based on the results obtained as well as consultancies with experts in the field of disaster or crises managers, fire-fighters, those methodologies are fully applicable in the current practice of crisis management, civil protection as well as operative management and coordination of emergency responders of Integrated Rescue system of the Slovak Republic. The only limitations are represented by the low level of knowledge and experience of the crises managers to work in the GIS environment and to use its tools and functions properly as well as the lack of extended GIS environments to provide the spatial analyses in them. In presence the provided GIS environments like CIPREGIS and GIS in CoordCom uses mostly the visualisation function of GIS.

Keywords: decision support, GIS, emergency, modelling

Muyambo, F., Restas, A., Jordaan, A.: Unmanned Aerial Vehicle (UAV) application in developing countries: a life-saving technology supporting crisis management.

Mitigating disaster impacts, responding to emergencies or carrying out post-disaster assessments are critical in both research and practice. However, remote rural areas, absence of or damaged infrastructure and hazardous post-disaster situations pose a challenge to such operations. This paper, therefore, explores the use of drones in developing countries. **Methods:** This paper focuses on civilian applications of unmanned aerial vehicles (UAVs) in developing countries. Literature study of different materials as well as personal experience in similar environments resulted in the compilation of this work. **Results:** UAVs come in many shapes and sizes and are useful both in developed and developing countries. They have been used to obtain imagery for disaster risk assessment and response. They also have been used in wildlife protection, delivery of medical samples to remote areas, mapping disaster risk, helping displaced persons and conflict emergency surveillance. UAVs provide an effective, fast and less expensive solution to save more lives and the environment in developing countries.

Keywords: unmanned aerial vehicle, drone, applications, developing countries, surveillance

Sedliak, M., Sačkov, I., Majlingova, A.: Sedliak, M., Sačkov, I., Majlingova, A.: Tree crown fuel volume quantification using remote sensing data.

The paper presents an approach to determine the volume of tree crowns biomass (fuel) in heterogeneous forests using the aerial remote sensing data acquired in the area of Smolnícka Osada, Slovakia. The basis for the identification of tree crowns and derivation of their parameters was the point cloud acquired by the airborne laser scanning and aerial multispectral images. To calculate the height and width of tree crowns in the 35 research plots, the reFLex software was used. The volume tree crowns biomass, the stems biomass, was derived from the diameter of the tree crown, using the modified algorithm published by Pretzsch. The volume of crown biomass itself (branches, twigs and leaves, needles) was derived for each tree species and age based on the statistical evaluation of data obtained from the forest inventory and their association to the analysed forest stands. The obtained data are a primary input to the modelling of crown fires in the FARSITE and FlamMap software environments.

Keywords: remote sensing, biomass, volume, forest fire, modelling

KATEDRA PROTIPOŽIARNEJ OCHRANY, DREVÁRSKA FAKULTA, TECHNICKÁ UNIVERZITA VO ZVOLENE

THE DEPARTMENT OF FIRE PROTECTION, THE FACULTY OF WOOD SCIENCES AND TECHNOLOGY, THE TECHNICAL UNIVERSITY IN ZVOLEN

Abstrakt

V príspevku sú uvedené stručné a prehľadové informácie o najdôležitejších faktoch vzniku, historického vývoja, súčasného stavu a vízie do budúcnosti Katedry protipožiarnej ochrany Drevárskej fakulty Technickej univerzity vo Zvolene.

Abstract

The contribution deals with the brief and summary information on the most important facts of establishment, historical development, current situation and future visions of the Department of Fire Protection at the Faculty of Wood Sciences and Technology of the Technical University in Zvolen.

Úvod

Technická univerzita vo Zvolene v roku 2017 oslavuje 255. výročie vysokoškolského technického štúdia na Slovensku, 210. výročie lesníckeho štúdia na Slovensku a 65. výročia založenia Vysokej školy lesníckej a drevárskej vo Zvolene, od roku 1992 Technickej univerzity vo Zvolene. Katedra protipožiarnej ochrany oslavuje 20 rokov svojej existencie ako významné pracovisko fakulty a samotnej univerzity.

História

História katedry sa odvíja od roku 1974, keď sa na oddelení Ochrany dreva Katedry mechanickej technológie dreva riešila problematika ochrany dreva pred požiarmi. V roku 1993 bolo akreditované študijné zameranie Požiarne bezpečnosť v drevospracujúcom priemysle.

Vďaka rastúcemu záujmu o riešenie otázok protipožiarnej ochrany a bezpečnosti medzi študentmi a v spoločnosti sa začala akademickým rokom 1997/1998 písať história samostatnej Katedry požiarnej ochrany so študijným odborom „Požiarne ochrana“. Prví absolventi tohto študijného odboru skončili svoje vysokoškolské štúdium v roku 2003. Od roku 2004 boli študenti prijímaní na bakalárske a inžinierske študijné programy v novom študijnom odbore „Ochrana osôb a majetku“, ktorý vzbudzoval veľký záujem medzi študentmi.

1. mája 2005 prijala katedra súčasný názov Katedra protipožiarnej ochrany. Symbolicky na oslavu výročia nového názvu boli v roku 2015 akreditované nové študijné programy v študijnom odbore „Záchranné služby“ vo všetkých troch stupňoch štúdia.

Profil

Katedra protipožiarnej ochrany je garančným pracoviskom pre študijný odbor Záchranné služby, v ktorom uskutočňuje výučbu v študijných programoch Protipožiarne ochrana a bezpečnosť v I., II. a III. stupni štúdia v dennej aj externej forme. Pracovníci katedry

Introduction

In 2017, the Technical University in Zvolen celebrates the 255th anniversary of university technical studies in Slovakia, 210th anniversary of forestry studies in Slovakia and the 65th anniversary of the University of Forestry and Wood Technology in Zvolen establishment, the Technical University in Zvolen since 1992. The Department of Fire Protection is celebrating 20 years of its existence as an important workplace of the Faculty and the University.

History

The history of the department began in 1974, when the Department of Wood Protection of the Department of Wood Mechanical Technology addressed the issue of protection of wood against fire. In 1993, the study field “Fire Safety in the Woodworking Industry” was accredited.

Due to the growing interest in addressing issues of fire protection and safety among the students and in the society, there the history of the Department of Fire Protection itself, with study field Fire Protection, has begun to be written, since the academic year 1997/1998. The first graduates of this study field finished their university study in 2003. Since 2004, the students began to study the bachelor and master study programs in a new study field “Protection of persons and property” that arouse great interest among students.

On May 1, 2005, the Department adopted the current name “Department of Fire Protection. Symbolically, on the 10th anniversary of the Department new name, there were accredited new study programs in the study field “Rescue Services” at all three levels of the university study, in 2015.

Profile

The Department of Fire Protection is a guarantee workplace for the study field “Rescue Services”, which take place in teaching in study programme “Fire Protection and Safety” at the 1st, 2nd and 3rd level of university study, in full-time and part-time form. The Department employees provide and teach the profile subjects related to

zabezpečujú a vyučujú profilové predmety z oblastí: horenie materiálov, reakcia materiálov na oheň, protipožiarna bezpečnosť stavieb, bezpečnosť technologických procesov, krízové riadenie, taktika, technické prostriedky, organizácia a činnosť jednotiek hasičských a záchranných služieb.

Absolventi uvedených študijných programov sa uplatňujú v zložkách Integrovaného záchranného systému, predovšetkým v Hasičskom a záchrannom zbore, na jednotlivých stupňoch v štátnej správe, vo verejnej správe, v organizáciách, u právnických a fyzických osôb podieľajúcich sa na ochrane osôb a majetku, či záchranných prácach, ako špecialisti na posudzovanie systémov protipožiarnej ochrany a bezpečnosti.

Vo výskume sa katedra profiluje v oblastiach materiálového výskumu, vnútornej bezpečnosti, nebezpečných látok, prevencii havárií, zisťovania príčin vzniku požiaru, manažmente rizík lesných požiarov, minimalizácie negatívnych dopadov na životné prostredie. Na základe vydaných akreditačných certifikátov má katedra oprávnenie na vykonávanie odbornej prípravy technikov a špecialistov požiarnej ochrany, preventívárov požiarnej ochrany obcí a základnej prípravy členov hasičských jednotiek.

Za významné úspechy KPO možno považovať uplatnenie absolventov na významných riadiacich pozíciách v HaZZ a vo vedúcich funkciách vzdelávacích inštitúcií podobného zamerania v SR. Absolventi úspešne pôsobia vo firmách zameraných na činnosti v oblasti PO a BOZP, operačných strediskách 112, závodných hasičských zboroch a útvaroch, Požiarnotechnickom a expertíznom ústave MV SR, Kriministickom a expertíznom ústave Policajného zboru MV SR a ako technici PO, špecialisti PO a bezpečnostní technici.

V roku 2007 bola Katedre protipožiarnej ochrany udelená plaketa HaZZ MV SR „Za zásluhy o rozvoj ochrany pred požiarimi“ a medaila DPO SR „Za mimoriadne zásluhy“. Pri príležitosti 10. výročia založenia FBI v roku 2012 udelil dekan FBI, VŠB Ostrava ČR, Katedre protipožiarnej ochrany Pamätnú medailu.

Zamestnanci

Prof. RNDr. Danica Kačíková, PhD.
 Doc. RNDr. Anna Danihelová, PhD.
 Doc. Ing. Andrea Majlingová, PhD.
 Doc. PaedDr. Peter Polakovič, PhD.
 Ing. Katarína Dúbravská, PhD.
 Ing. Ján Horváth, PhD.
 Ing. Mgr. Ivan Chromek, PhD.
 Ing. Iveta Mitterová, PhD.
 Ing. Eva Mračková, PhD.
 Ing. Emília Orémusová, PhD.
 Ing. Ľudmila Tereňová, PhD.
 Ing. Veronika Velková, PhD.
 Ing. Martin Zachar, PhD.
 Danica Hanáková
 Danka Ľuptáková
 Zuzana Volková

burning of materials, materials reaction to fire, fire safety of buildings, safety of technological processes, crisis management, tactics, technical resources, organization and management of fire and rescue services.

The graduates are in the employ of the Integrated Rescue System, especially in the Fire and Rescue Service, in the state administration, public administration, in organizations, legal and physical bodies involved in the protection of persons and property, or rescue works, as specialists for evaluation of fire protection and safety systems.

In research, the Department is profiled in the areas of materials research, internal security, hazardous substances, accident prevention, fire investigation, forest fire risk management and minimizing the negative impacts on the environment.

Based on the issued accreditation certificates, the Department of Fire Protection has a permission to provide professional education of technicians and specialists in the fire protection field, municipality fire prevention bodies as well as basic training of fire brigades members. As significant achievement of the Department can be considered the success of graduates at significant management positions in the Fire and Rescue System and in leadership roles at educational institutions of similar focus in Slovakia. The graduates successfully operate in companies aimed at fire protection, occupational health and safety activities, operational centre 112, enterprise fire brigades and departments, Fire Research Institute of the Ministry of Interior, Criminalistics and Forensic Science Institute of the Police Force Ministry of the Interior and as fire protection technicians, specialists and safety technician.

In 2007, the Department of Fire Protection was awarded with a plaque of the Fire and Rescue System, Ministry of Interior of the Slovak Republic "For Contributions to the Development of Fire Protection" and medal of Voluntary Fire Protection of the Slovak Republic "For Special Merits". In 2012, on the occasion of the 10th anniversary of the Faculty of Safety Engineering, VSB - Technical University of Ostrava, Czech Republic, the Dean of the Faculty awarded the Department of Fire Protection with commemorative medal.

Employments

Prof. Danica Kačíková, PhD.
 Assoc. prof. Anna Danihelová, PhD.
 Assoc. prof. Andrea Majlingová, PhD.
 Assoc. prof. Peter Polakovič, PhD.
 Katarína Dúbravská, PhD.
 Ján Horváth, PhD.
 Ivan Chromek, PhD.
 Iveta Mitterová, PhD.
 Eva Mračková, PhD.
 Emília Orémusová, PhD.
 Ľudmila Tereňová, PhD.
 Veronika Velková, PhD.
 Martin Zachar, PhD.
 Danica Hanáková
 Danka Ľuptáková
 Zuzana Volková

Záver

Našou víziou do budúcnosti je:

- budovanie silného konkurenčne schopného pracoviska s kvalitne pripravenými absolventmi odboru Záchranne služby zameraných na protipožiarnu ochranu a bezpečnosť;
- rozvíjanie medzinárodne akceptovateľného výskumu vo výskumnej oblasti bezpečnostnej služby zameraného na hodnotenie materiálov a výrobkov ako aj negatívnych environmentálnych dôsledkov požiarov a ich likvidácie v súlade s hlavnými smermi výskumu TU vo Zvolene;
- prehĺbovanie domácej a medzinárodnej spolupráce so vzdelávacími a výskumnými inštitúciami ale aj s praxou, predovšetkým s najväčším odberateľom našich absolventov, s HaZZ;
- šírenie dobrého mena pracoviska medzi študentmi, kolegami z univerzity ako aj v kontakte s verejnosťou;
- propagácia študijných programov a diseminácia originálnych výsledkov výskumu;
- zabezpečenie a organizovanie dlhodobého rozvoja pracoviska s využívaním silných stránok pracoviska a jeho pracovníkov a znižovaním negatívnych dopadov slabých stránok;
- a v neposlednom rade vytvorenie atmosféry spolupatričnosti a dobrej pracovnej a spoločenskej klímy na pracovisku.

Conclusion

Our vision for the future is:

- Building a strong competitive workplace with well-prepared graduates of the Rescue Services study field focused on fire protection and safety;
- Developing the internationally acceptable research in the Security Services field of research, aimed at evaluation of materials and products as well as the negative environmental impact of fires and their extinguishing in accordance with the main research topics of the Technical University in Zvolen;
- Strengthening the national and international cooperation with educational and research institutions as well as the practice, particularly with the largest employers of our graduates, with the Fire and Rescue Service;
- Propagating the good name of the workplace among the students, university colleagues as well as in contact with the public;
- Promotion of study programs and dissemination of original research results;
- Supporting the long-term development of the workplace fully using its strengths as well as the strength of its employees and reducing the negative impacts of its weaknesses;
- And last but not least, creating an atmosphere of togetherness and good working and social climate at the workplace.

*prof. RNDr. Danica Kačíková, PhD.,
doc. Ing. Andrea Majlingová, PhD.
Katedra protipožiarnej ochrany*

*Professor Danica Kačíková, PhD.,
Assoc. prof. Andrea Majlingová, PhD.
the Department of Fire Protection*



Zamestnanci Katedry protipožiarnej ochrany
Employees of the Department of Fire Protection

VEDECKÉ A ODBORNÉ KONFERENCIE ORGANIZOVANÉ A SPOLUORGANIZOVANÉ KATEDROU PROTIPOŽIARNEJ OCHRANY

SCIENTIFIC AND PROFESSIONAL CONFERENCES ORGANIZED AND CO-ORGANIZED BY THE DEPARTMENT OF FIRE PROTECTION

MEDZINÁRODNÁ VEDECKÁ KONFERENCIA „WOOD & FIRE SAFETY“

Tradičné stretnutie odborníkov z oblasti protipožiarnej ochrany, ktorí preferujú drevo a materiály na báze dreva sa koná v pravidelných štvorročných intervaloch (vždy keď horí olympijsky oheň letných olympiád). Začiatok týchto stretnutí datujeme do roku 1988 (pozri fotografiu na obr. 1). Táto konferencia sa konala pri príležitosti 60. výročia narodenia prof. Ing. Dionýza Horského, DrSc, (6. 1. 1928 – 13. 6. 1998) na fotografii je menovaný šiesty zľava pri účastníkovi z Japonska, ktorým bol prof. S. Ishihara.

INTERNATIONAL SCIENTIFIC CONFERENCE „WOOD & FIRE SAFETY“

The traditional meeting of experts in the field of fire protection, who prefer wood and wood-based materials, is held at regular four-year intervals (every time, when the Olympic flame of the Summer Olympic Games burns). Beginning of these meetings dates back to 1988 (see photo in Fig. 1). The conference was held on the occasion of the 60th birth anniversary of a professor Dionýz Horský, (1.6.1928 - 13.6.1998), on the photo, he is the sixth on the left, besides the participant from Japan - professor S. Ishihara.



Obr. 1 Účastníci konferencie Horenie dreva v roku 1988

Fig. 1 Participant of the "Horenie dreva / Wood Burning" Conference in 1988

O tento prvý ročník prejavilo záujem veľa zahraničných účastníkov. Preto druhý ročník sa konal pod anglickým názvom Wood Burning 92, aby bol lepšie čitateľný pre zahraničných záujemcov. Tento názov prispel k väčšiemu počtu zahraničných účastníkov, ale spôsobil starosti organizátorom konferencie, ktorí museli vyradiť veľký počet príspevkov, ktoré sa týkali spaľovania dreva, jeho horenia v kúreniskách a pod., čo nebolo cieľom konferencie. Preto tretí ročník v roku 1996 sa konal pod názvom Wood & Fire Safety. Tento názov si ponechali aj ďalšie ročníky konferencie. Preto, že to bol prvý ročník pod týmto názvom prinášam z neho aj niekoľko fotografií (obr. 2 - 4). Fotografie sú z osobného archívu prof. Osvald). V tabuľke 1 sú základné informácie o jednotlivých konferenciách.

About this first year many foreign participants expressed interest. Therefore, the second year was held under the English title "Wood Burning 92" to be more readable for foreign applicants. This name had contributed to more foreign participants, but caused worries organizers of the Conference, who had to exclude a large number of contributions related to wood burning, wood combustion in furnaces, etc., that was not the aim of the Conference. Therefore, the third year, in 1996, was held under the name "Wood & Fire Safety". The title retained also for the next years of the Conference. Because it was the first year under this name, I provide several images (Fig. 2-4) from those events. Photos are from the personal archive of professor Osvald. Table 1 gives the basic information about each conference.



Obr. 2 Robert H. White, zástupca odborného garanta konferencie v rokoch 1992 – 2008, pracovník U.S. Forest Service Research & Development, Washington DC, U.S.A.

Fig. 2 Robert H. White, Deputy of Conference Scientific Guarantor in 1992-2008, employee of the U.S. Forest Service Research & Development, Washington DC, U.S.



Obr. 3 Významní pravidelní účastníci konferencí Wood & Fire Safety

- a) BOGDAN Z. DLUGOGORSKI, professor a súčasný dekan, School of Engineering and Information Technology, Murdoch University, Perth, Australia
- b) TOSHIRO HARADA, Forestry and forest product, Research institute, Kyoto, Japonsko
- c) BIRGIT L. ÖSTMAN, Trätekt – Swedish Institute for Wood Technology Research, Stockholm, Švédsko (za svoju vedeckú prácu bola ocenená švédskym kráľom)

Fig. 3 Prominent regular participants of the Wood & Fire Safety Conferences

- a) BOGDAN Z. DLUGOGORSKI, professor and current Dean, School of Engineering and Information Technology, Murdoch University, Perth, Australia
- b) TOSHIRO HARADA, Forestry and forest product, Research institute, Kyoto, Japan
- c) BIRGIT L. ÖSTMAN, Trätekt – Swedish Institute for Wood Technology Research, Stockholm, Sweden (For her scientific work she was awarded by the Swedish king.)



Obr. 4 Predsedníctva jednotlivých blokov konferencie Wood & Fire Safety v roku 1996

- a) kanadsko slovenské predsedníctvo JOHN R. MEHAFFEY, Division of Building Research National Research Council of Canada, Ottawa, Canada, ANTON OSVALD, Drevárska fakulta, Technická univerzita vo Zvolene, Zvolen, Slovensko
- b) predsedníctvo z Oceánie, PAUL CLANCY, Faculty of Engineering and Science Victoria University of Technology, Victoria, Austrália, ANDY BUCHANAN, University of Canterbury, Christchurch, Nový Zéland



Fig. 4 Presidency of the respective sections of the Wood & Fire Safety conference in 1996

- a) Canadian - Slovak Presidency JOHN R. MEHAFFEY, Division of Building Research National Research Council of Canada, Technical University in Zvolen, Slovakia
- b) Presidency from Oceania, PAUL CLANCY, Faculty of Engineering and Science Victoria University of Technology, Victoria, Australia, ANDY BUCHANAN, University of Canterbury, Christchurch, New Zealand

Všetky konferencie sa konali na tradičnom mieste, hotel Patria na Štrbskom Plese, v tradičných štvorročných intervaloch s tradičným programom. Uvedená tradícia bola založená v roku 1988. Od tohto prvého stretnutia po posledné v roku 2016, sa na konferencii zúčastnilo viac ako 750 účastníkov, z toho 224 bolo zahraničných. Pravidelnými účastníkmi konferencie sú aj delegáti z mimo európskych štátov hlavne z Kanady, USA, Nového Zélandu, Austrálie, Japonska, v posledných rokoch aj z Číny. Európske štáty nebudem menovať, lebo ich zastúpenie je veľmi početné a hranice a názvy štátov sa mnoho krát menili len účastníci ostávali rovnakí.

All the conferences were held at the traditional location, the hotel Patria in Štrbské Pleso, in traditional four-year intervals with a traditional program. The above tradition was established in 1988. Since that first meeting up to the latest in 2016, the Conference attended more than 750 participants, of which 224 were foreign. The regular participants of the Conference are also delegates from the non - European countries, mainly from Canada, U.S., New Zealand, Australia, Japan, in recent years, also from China. I am not naming the European countries, because their presence is very large and the borders and names of countries has changed many times, only the participants remain the same

Cieľom konferencií je prinášať nové poznatky z tohto multidisciplinárneho odboru. Jedná sa o horenie tuhých materiálov, modelovanie, meranie, testovanie horľavosti, štruktúra a vlastnosti dreva a ich zmeny pri vysokých teplotách, štúdium etáp procesu horenia dreva, retardáciu horenia dreva a materiálov na báze dreva, protipožiarna bezpečnosť v drevených objektoch, skúsenosti s likvidáciou požiarov v drevených budovách, skúsenosti s likvidáciou lesných požiarov, skúsenosti s likvidáciou požiarov v historických budovách, a iné.

Každý ročník konferencie, okrem odborných prednášok a posterovej sekcie, sprevádzala aj výstava sponzorov v hoteli Patria, a sprievodné podujatie pred hotelom, alebo v spoločnosti Fires s.r.o. Nesmieme zabudnúť ani na spoločenské podujatia počas konferencie, ktoré pre nás vždy veľmi kvalitne pripravili pracovníci hotela Patria. Na tomto mieste by sme sa im chceli poďakovať, ako aj všetkým sponzorom, ktorých nebolo málo, ale predovšetkým všetkým tým, ktorí pomáhali jednotlivé ročníky konferencie pripravovať a trpezlivo zvládali nie len prípravu konferencie ale aj náročnú prácu organizátorov konferencií počas ich priebehu.

Tabuľka 1. Dátumy, názvy a organizátori konferencií

Dátum	Názov konferencie	Organizátor konferencie
11. - 13. 5. 1988	Horenie dreva	Dom techniky Žilina
01. - 05. 6. 1992	Wood Burning 92	TUZVO
06. - 09. 5. 1996	Wood & Fire Safety	TUZVO
14. - 19. 5. 2000	Wood & Fire Safety	TUZVO
18. - 22. 4. 2004	Wood & Fire Safety	TUZVO
11. - 15. 5. 2008	Wood & Fire Safety	TUZVO
13. - 16. 5. 2012	Wood & Fire Safety	UNIZA
08. - 12. 5. 2016	Wood & Fire Safety	UNIZA

Stretneme sa na deviatom ročníku konferencie Wood & Fire Safety verím, že v hoteli Patria, 3. – 6. mája 2020.

*Associated Professor Linda Makovická Osvaldová, PhD.,
Scientific Guarantor of the Wood & Fire Safety Conference*

The aim of the Conferences is to bring new knowledge of this multidisciplinary field. It is the combustion of solid materials, modelling, measuring, testing of flammability, structure and properties of wood and their changes at high temperatures, the study of stages of the wood burning process, flame-retardant treatment of wood and wood-based materials, fire safety in wooden buildings, experience with a fire-fighting in wooden buildings, experience with the forest fires fighting, the experience with a fire-fighting in a historical building, and others.

Each year of the Conference, in addition to specialist lectures and poster section, was accompanied by an exhibition of sponsors in the hotel Patria, outdoor events in the front of the hotel, or in the company Fires Ltd. We do not forget the social events during the Conference, which always very well prepared by the staff of the hotel Patria for us. At this point, we would like to thank them and all the sponsors, but to all those who helped to prepare the individual years of the Conference and patiently managed not only preparing the Conference but also the hard work of the organizers of the Conferences during their course.

Table 1. Dates, titles and organisers of the conferences

Date	Conference title	Conference Organiser
11. - 13. 5. 1988	Horenie dreva / Wood Burning	Dom techniky Žilina
01. - 05. 6. 1992	Wood Burning 92	TUZVO
06. - 09. 5. 1996	Wood & Fire Safety	TUZVO
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18. - 22. 4. 2004	Wood & Fire Safety	TUZVO
11. - 15. 5. 2008	Wood & Fire Safety	TUZVO
13. - 16. 5. 2012	Wood & Fire Safety	UNIZA
08. - 12. 5. 2016	Wood & Fire Safety	UNIZA

Let's meet at the 9th annual conference "Wood & Fire Safety", I believe that in the hotel Patria, on 3. 5. – 6. 5. 2020.

*Associated Professor Linda Makovická Osvaldová, PhD.,
Scientific Guarantor of the Wood & Fire Safety Conference*

FIRE ENGINEERING – VEDECKÉ MEDZINÁRODNÉ KONFERENCIE – INTERNATIONAL SCIENTIFIC CONFERENCES

Po roku 2000 vznikol deficit spolupráce a rozvoja v oblasti protipožiarnej ochrany medzi vedecko-výskumnými zamestnancami a erudovanými odborníkmi v strednej Európe. Uvedený nedostatok na Katedre požiarnej ochrany si zobrali pod odbornú garanciu doc. Alexander Krakovský, CSc. a doc. RNDr. Iveta Marková, PhD., ktorí s organizačným garantom Ing. Evou Mračkovou, PhD. a riaditeľom výstav Mgr. Ing. Ivanom Chromekom, PhD. so štvorročnou frekvenciou organizovali medzinárodné vedecké konferencie FIRE ENGINEERING. Prvá a druhá medzinárodná vedecká konferencia Fire Engineering sa konala v Kongresovom centre hotela Reduta v Lučenci v termínoch 30. 09. – 3.10. 2002 a 3.10. – 5. 10. 2006.

Uvedomovali sme si závažnosť situácie a účastníkom sme chceli zabezpečiť a poskytnúť najvyššiu úroveň prednášok a zaujímavý sprievodný program. Zabezpečili sme ho vďaka prijatým projektom Medzinárodného višegrádskeho fondu. Naši partneri boli z krajín višegrádskej štvorky: za Českú republiku trikrát „Sdružení požárního bezpečnostního inženýrství“ Ostrava, za Poľskú republiku dvakrát Politechnika Opolska, Wydział Budownictwa, jedenkrát Ogólnopolskie Stowarzyszenie Producentów Zabezpieczeń Przeciwożarowych i Sprzętu Ratowniczego Warszawa Poľsko a za Maďarskú republiku jedenkrát Nyugat-magyarországi Egyetem, Faipari Mérnöki Kar Sopron, jedenkrát Katasztrófavédelmi Igazgatóság Győr – Moson – Sopron megyei, Győr a jedenkrát FER tűzoltóság és szolgáltató kft. Százhalombatta.

Vysoký záujem zahraničných a domácich účastníkov bol prejavom potreby realizovať dané podujatia, ktoré prebiehali v koordinácii s vedcami a odborníkmi prejednávajúcimi najnovšie vedecké, teoretické, ale aj praktické poznatky, znalosti a skúsenosti z multidisciplinárnej oblasti z ktorých pozostáva práca hasičského a záchranného systému.

Jednania prebiehali v sekciách tematicky zoradených prednášok, vo vedeckých oblastiach: požiarne bezpečnosť stavieb, požiarne technika a taktika, informačné technológie, chémia horenia a hasenia a vzdelanie v PO. V ďalších ročníkoch konferencií došlo k zmene sekcie na protipožiarne bezpečnosť stavieb a rozšírili sa pracovné zasadania o sekcie protivýbuchová prevencia a bezpečnosť technológií a fyzická a psychická zdatnosť hasiča záchranára.

Posledný deň prvej konferencie program spočíval prezentáciami príspevkov v sekcii „požiarne technika a taktika“ a ukončili sme ho výstavou hasičskej leteckej a mobilnej techniky na letisku Lučenec – Bolkovce.

Druhej konferencie sa zúčastnilo 230 odborníkov, pričom bolo prezentovaných 73 príspevkov. Sprievodnými akciami konferencie bola historická výstava „Človek a oheň“ z Krajského múzea v Prešove a ukážky identifikácie nebezpečných látok laserovou technikou. Naši študenti realizovali súťaž „Železný hasič“ v areáli Kongresového centra hotela Reduta v Lučenci v budove ESO. Zámerom konferencie bolo vytvoriť sieť kontaktov s odborníkmi zaoberajúcich sa širokou

After 2000, occurred a deficit in the co-operation and development in the field of fire protection between research staff and knowledgeable experts in Central Europe. This lack had taken under professional guarantee associated professor Alexander Krakovský, PhD. and associated professor Iveta Marková, PhD. At the Department of Fire Protection, who with organizational guarantor Eva Mračková, PhD. and director of exhibitions Ivan Chromek, PhD., in the four-years frequency organised the International Scientific Conferences FIRE ENGINEERING. The first and second International Conference Fire Engineering was held in the Congress Centre of Hotel Reduta in Lučenec on 30. 09. - 10.03.2002 and 3.10 - 5.10.2006.

We were aware of the seriousness of the situation and we wanted participants to ensure and provide with the highest level of lectures and interesting accompanying program. It was possible thanks to the International Visegrad Fund projects. Our partners were the countries of the Visegrad Group: three times the “Association of Fire Safety Engineering” in Ostrava, the Czech Republic, twice the Politechnika Opolska, Wydział Budownictwa in Poland, once Ogólnopolskie Stowarzyszenie Producentów Zabezpieczeń Przeciwożarowych and Sprzętu Ratowniczego Warszawa, Poland, and once Nyugat-magyarországi Egyetem, Faipari Mérnöki Kar Sopron, once Katasztrófavédelmi Igazgatóság Győr – Moson – Sopron megyei, Győr and once FER tűzoltóság és szolgáltató kft. Százhalombatta, Hungary.

High interest of foreign and home participants was a manifestation of the need to implement the events that were held in co-ordination with scientists and experts discussing the latest scientific, theoretical but also practical knowledge, skills and experience from the multidisciplinary areas, of which is constituted the work of the Fire and Rescue System.

The discussions were held in sections of thematically arranged lectures, in scientific fields: Fire Safety of Buildings, Fire Equipment and Tactics, Information Technologies, Chemistry of Fire and Fire Extinguishing and Education in the Fire Protection. In the next years of the Conference, there were completed the working sessions with the Explosion Prevention and Technologies Safety, and Physical and Mental Fitness of the Fire-fighter - Rescuer sections.

The last day of the first Conference, the program was composed of presentations in the «Fire Equipment and Tactics» and we finished it with exhibition of air and mobile fire-fighting equipment at the airport Lučenec - Bolkovce.

The second Conference was attended by 230 experts. There were presented 73 contributions. The accompanying events of the Conference were a historic exhibition «Man and Fire» from the Regional Museum in Prešov and demonstrations of identifying hazardous substances by laser technology. Our students realised the contest «Iron Fireman» in the area of the Congress Centre of Hotel Reduta in Lučenec, in the ESO building. The aim of the Conference was to create a network with professionals dealing with wide issues of firemen, which was on the spot and there have been recorded

problematikou hasičstva, ktorá sa vydarila a došlo k výrazným pokrokom v spolupráci v oblasti protipožiarnej ochrany. Stanovený cieľ konferencie ponúknú priestor na výmenu vedeckých poznatkov, odborných vedomostí, skúseností a kontaktov odborníkom zo školstva, výskumu a praxe, v širokom spektre problematiky protipožiarneho inžinierstva bol splnený a všetci sa už netrpezlivo pýtali na ďalší termín konferencie. 3. medzinárodná vedecká konferencia Fire Engineering sa konala 5. a 6. októbra 2010 na Technickej univerzite vo Zvolene. Zúčastnilo sa jej 207 odborníkov z 8 krajín Európy, pričom bolo prezentovaných 61 príspevkov. Obsahovo nadväzovala na konferencie z rokov 2002 a 2006. Odborná garantka doc. RNDr. Iveta Marková, PhD., organizačný garant Ing. Eva Mračková, PhD., a riaditeľ výstavy Mgr. Ing. Ivan Chromek, PhD. chceli účastníkom sprostredkovať stretnutie na akademickej pôde.

a significant progress in co-operation in the field of fire protection. Stated objective of the Conference, to offer a platform for the exchange of scientific knowledge, expertise, experience, contacts for professionals from the education, research fields and practice in a wide range of issues of fire protection engineering, was met and everyone eagerly asked for new term of the Conference. The 3rd International Conference Fire Engineering was held on 5.10. – 6.10.2010 at the Technical University in Zvolen. It was attended by 207 experts from 8 European countries, which presented 61 contributions. With its content, the Conference followed up to the years 2002 and 2006. The Scientific guarantor - associated professor Iveta Marková, PhD., Organizational guarantor - Eva Mračková, PhD., Director of exhibitions - Ivan Chromek, PhD. wanted allow the participants to meet at an academic ground.



Obr.1 Spoločná fotografia účastníkov Fire Engineering 2010
Fig. 1 Common photo of participants of the Fire Engineering 2010

Medzi účastníkmi konferencie boli aj zástupcovia a odborníci z partnerských vysokých škôl z Čiech, Srbska, Poľska a Ruska. Pracovné jednanie konferencie prebiehali obdobne ako v minulosti v samostatných sekciách. Sprievodnými akciami konferencie boli viaceré podujatia výstavy umeleckých prác študentov dizajnu Drevárskej fakulty Technickej univerzity vo Zvolene, výstava hasičskej a záchranárskej techniky a požiaro-technických zariadení, doplnená praktickými ukázkami hasenia v neprístupnom teréne. V rámci sprievodného programu vystúpil aj Folklórny súbor Polana a vystúpenie skupiny historického šermu na Pustom hrade.

Účastníci všetkých troch konferencií si prevzali úplné znenie príspevkov v anglickom a národnom jazyku, ktoré boli uverejnené v zborníkoch z konferencií. Súčasťou konferenčných materiálov boli monografie, ktoré predstavovali základné informácie o konferenciách, organizátoroch, Medzinárodnom višegrádskom fonde (IVF) a partneeroch V4. Organizátori konferencie veria, že výsledky publikovaných

Among the participants of the Conference were the representatives and experts from the partner universities from the Czech Republic, Serbia, Poland and Russia. The Conference discussions were held similarly as in the past, in separate sections. Accompanying events of the Conference were several events, exhibition of art works of the Design students of the Faculty of Wood Sciences and Technology, Technical University in Zvolen, exhibition of fire-fighting and rescue equipment and fire-technical equipment, supplemented by practical demonstrations of fire-fighting in inaccessible terrain. The accompanying program was completed with the folk group Polana display and performance of a historical fencing group in the Pustý Hrad.

The participants in all three conferences had been provided with the full texts of the contributions in English and in the national language. Those were published in the Conference Proceedings. A part of Conference materials were the monographs, which pre-

prác prispievajú k inovácii a aktualizácii poznatkov v oblasti protipožiarnej ochrany, ochrany majetku a zdravia a ochrany životného prostredia pred požiarom, ale aj hasičským jednotkám pri vykonávaní záchranných prác pri požiaroch, živelných pohromách a iných mimoriadnych udalostiach.

sented the basic information about the conference, the organizers, the International Visegrad Fund (IVF) and V4 partners. The Conference organizers believe that the results of published works will contribute to innovation and updating knowledge in the field of fire protection, protection of property and health and environment against fire, but also the fire brigades in carrying out rescue operations in fires, natural disasters and other emergencies.



Obr. 2 Účastníci I. ročníka konferencie Fire Engineering v roku 2006
Fig. 2 The participants of the first year of Fire Engineering Conference in 2006

Ďakujeme účastníkom, kolegom, študentom, priateľom a všetkým nemenovaným za ich aktívnu účasť na konferenciách a ďakujeme tiež Krajskému riaditeľstvu HaZZ v Banskej Bystrici a Okresnému riaditeľstvu HaZZ v Lučenci a vo Zvolene za podporu pri realizácii praktických podujatí konferencie.

We would like to thank to participants, colleagues, students, friends and all the unnamed for their active participation at the conferences and also to the Regional Directorate of Fire and Rescue Service in Banská Bystrica, District Directorates of Fire and Rescue Service in Lučenec and Zvolen for their support in the implementation of practical demonstration during the Conference.

*Ing. Eva Mračková, PhD
organizačný garant konferencií
Fire Engineering*

*Eva Mračková, PhD.
Organisational Guarantor
of the Fire Engineering Conferences*

TEPLO-OHEŇ-MATERIÁLY / HEAT-FIRE-MATERIALS – TRI ROČNÍKY MEDZINÁRODNÉHO VEDECKÉHO PODUJATIA ORGANIZOVANÉHO NA KPO DF TUZVO

HEAT-FIRE-MATERIALS – THREE YEARS OF ORGANISING THE INTERNATIONAL SCIENTIFIC CONFERENCE AT THE DPO FWST TUZVO

Abstrakt:

Významným periodickým vedeckým podujatím s medzinárodným vedeckým výborom a účasťou zahraničných odborníkov je sympóziu s názvom Teplo-ohň-materiály (TOM) / Heat-Fire-Materials (HFM). Prvý ročník sa konal v roku 2007, druhý v roku 2011 a tretí v roku 2015. Uvedené medzinárodné sympóziá mali pozitívne ohlasy medzi vysokoškolskými pedagógmi, pracovníkmi výskumu v oblasti požiarného inžinierstva a ochrany pred požiarmi, členmi DPO SR a HaZZ SR ako aj medzi vysokoškolskými študentmi.

Abstract:

An important periodic scientific event with the international scientific committee and the participation of foreign experts is the Symposium entitled Teplo-ohň-materiály (TOM) / Heat-Fire-Materials (HFM). The first year was held in 2007, the second in 2011 and the third in 2015. These international symposia had positive feedback between university teachers, fire engineering and fire protection research workers, members of the Voluntary Fire Protection of the Slovak Republic and the Fire and Rescue Service as well as among university students.

Úvod

Katedra protipožiarnnej ochrany Drevárskej fakulty Technickej univerzity vo Zvolene od svojho vzniku organizovala veľa kvalitných vedeckých, odborných a športových podujatí pre odbornú aj laickú verejnosť. Zamestnanci katedry využívali svoje kontakty s významnými vysokoškolskými pedagógmi, vedeckými pracovníkmi, akreditovanými skúšobňami, členmi HaZZ a DPO pri príprave vedeckých konferencií a sympózií. V súvislosti so širokým vedeckým aj pedagogickým zameraním sa postupne ukazovala potreba zorganizovania podujatia, ktorého cieľom je priniesť najnovšie informácie a skúsenosti vedeckých, výskumných a skúšobných pracovníkov, výrobcov, ako aj členov hasičských zborov, so správaním a zmenami konštrukčných materiálov, kompozitov a výrobkov z nich za zvýšených teplôt a najmä s ich zmenami pôsobením ohňa. V roku 2006 sa preto začalo s prípravou nového periodického podujatia s názvom Teplo-ohň-materiály / Heat-Fire-Materials, ktorého prvý ročník bol naplánovaný na prvý štvrtrok roku 2007.

Introduction

The Department of Fire Protection at the Faculty of Wood Sciences and Technology at the Technical University in Zvolen has organized many high-quality scientific, professional and sport events for its professional and non-professional public. The staff of the Department used their contacts with other university educators, scientists, accredited testing laboratories, members of Fire and Rescue Service and Voluntary Fire Protection in the preparation of scientific conferences and symposia. In connection with a broad scientific and pedagogical focus, the need for organizing an event, which aims to bring the latest information and experience of scientists, research and testing staff, manufacturers and fire brigade members, on the behaviour and changes of construction materials, composites and products from them at increased temperatures and in particular with their fire caused changes. In 2006, therefore, a new periodic event called "Teplo-ohň-materiály / Heat-Fire-Materials" was scheduled for the first quarter of 2007.



Prvý ročník – TOM 2007

TOM 2007, 1. medzinárodné sympóziu s výstavou sa uskutočnilo 6.-9. februára 2007 v priestoroch hotela Partizán a.s. Tále. Patronát nad sympóziom TOM 2007 prevzali plk. Ing. Jozef Paluš, prezident HaZZ SR a prof. Ing. Ján Tuček, PhD., rektor Technickej univerzity vo Zvolene. Za členov medzinárodného vedeckého výboru boli oslovení nasledujúci významní odborníci: doc. Ing. Miroslava

First year – TOM 2007

TOM 2007, the 1st International Symposium with Exhibition took place in the area of hotel Partizán a.s. Tale on February 6th - 9th, 2007. The patronage over TOM 2007 Symposium took Col. Jozef Paluš, President of Fire and Rescue Service and prof. Ján Tuček, PhD., Rector of the Technical University in Zvolen. The following prominent experts were addressed to the members of the International Scientific Committee: assoc. prof. Miroslava Netopilová, PhD., Czech Republic; Dr. Birgit Östman, Sweden; prof. Pavol Poledňák, PhD., Slovak Republic; Dr. Reinhard Grabski, Germany; Dr. Jim Mehaffey, Canada; Dr. Esko Mikkola, Finland. The guarantor of the event was assoc. prof. Danica Kačíková, PhD.

Netopilová, PhD., Česká republika; Dr. Birgit Östman, Švédsko; prof. Ing. Pavol Poledňák, PhD., Slovenská republika; Dr. Reinhard Grabski, Nemecko; Dr. Jim Mehaffey, Kanada; Dr. Esko Mikkola, Fínsko. Garantom podujatia bola doc. RNDr. Danica Kačíková, PhD.

Rokovanie sympózia bolo rozdelené do troch sekcií:

1. Reakcia materiálov a výrobkov na teplo a oheň.
2. Protipožiarne skúšobníctvo.
3. Prezentácie materiálov a výrobkov slovenských a zahraničných firiem.

Vedecko-odbornými garanti jednotlivých sekcií boli: prof. Ing. Karol Balog, PhD., doc. RNDr. Anna Danihelová, PhD., prof. RNDr. František Kačík, PhD., doc. Ing. Imrich Mikolai, PhD., prof. Ing. Anton Osvald, CSc., Ing. Štefan Rástocký, plk. Ing. Ján Rešetár, PhD., Ing. Josef Rychlý, DrSc., prof. Ing. Jozef Štefko, PhD., Ing. Ludmila Tereňová, PhD.

Hlavným cieľom sympózia bolo bližšie prepojenie výskumno-vývojových a vzdelávacích inštitúcií s praxou v oblasti zmien materiálov po zaťažení teplom a ohňom. Na sympóziu bolo prítomných 33 účastníkov, z toho 3 zo zahraničia. Počas rokovaní bolo prednesených 24 referátov a uskutočnila sa výstavka produktov a propagačných materiálov 10 firiem (BASF stavebné hmoty, s.r.o. Žilina, Doprastav, a.s. Bratislava, Ecoltech, spol. s.r.o. Lučenec, Hilti Slovakia, spol. s.r.o., Bratislava, Izomat, a.s. Nová Baňa, Knauf, s.r.o. Bratislava, Op-tim, spol. s.r.o. Krupina, Rockwool Slovensko, s.r.o. Bratislava, Stavmix Plus, s.r.o. Stupava a Stokat-M, s.r.o. Zvolen). Abstrakty príspevkov boli uverejnené v novozaloženom časopise Delta, č. 1, ročník I, 2007 ISSN 1337-0863. Plné texty príspevkov boli publikované na CD nosiči – Zborník z 1. medzinárodného sympózia s výstavou Teplo-Oheň-Materiály 2007, ISBN 978-80-228-1719-6.

Výsledkom rokovaní v jednotlivých sekciách bolo odovzdávanie najnovších poznatkov a skúseností medzi výskumnými a vývojovými pracoviskami, vysokými školami, akreditovanými skúšobňami, stavebnými firmami a firmami s výrobkami s vysokou požiarou odolnosťou o zmenách materiálov vplyvom tepla a ohňa a metódach hodnotenia a testovania materiálov a výrobkov.

Pred ukončením sympózia garanti sekcií, zástupcovia medzinárodného vedeckého výboru a odborný garant vyhodnotili priebeh sympózia a úroveň uverejnených článkov a prezentovaných referátov. Navrhli publikovať niektoré príspevky v ďalších číslach časopisu Delta. Konštatovali, že došlo k splneniu vytýčeného cieľa. Odporučili osloviť zástupcov zúčastnených firiem s požiadavkou pripraviť a vykonať prednášky pre študentov a pedagógov vo všetkých stupňoch v študijnom odbore Ochrana osôb a majetku na Drevárskej fakulte Technickej univerzity vo Zvolene. Predstaviiteľka vedenia univerzity, prorektorka Danihelová, pozitívne hodnotila vytvorenie nových pracovných aj osobných kontaktov a uverejnenie abstraktov článkov publikovaných v zborníku príspevkov a v časopise Delta, čím sa informácie dostanú k širokému okruhu odbornej verejnosti. Predstaviiteľ praxe, riaditeľ PTEÚ, plk. Rešetár, zdôraznil, že odznali mnohé zaujímavé príspevky s prínosnými poznatkami, ktoré môžu byť v ďalšej spolupráci využité v expertíznej činnosti hlavne v rámci zisťovania príčin požiarov.

The symposium was divided into three sections:

1. Reaction of materials and products to heat and fire.
2. Fire Testing.
3. Presentation of materials and products of Slovak and foreign companies.

The scientific and expert guarantors of the individual sections were: prof. Karol Balog, PhD., assoc. prof. Anna Danihelová, PhD., Prof. František Kačík, PhD., assoc. prof. Imrich Mikolai, PhD., Prof. Anton Osvald, PhD., Štefan Rástocký, col. Ján Rešetár, PhD., Josef Rychlý, DrSc., Prof. Jozef Štefko, PhD., Ludmila Tereňová, PhD.

The main objective of the symposium was to link research-development and educational institutions more closely with the practice in the area of changing the materials after the heat and fire loading. The symposium was attended by 33 participants, including 3 from abroad. During the symposium, 24 papers were presented and an exhibition of products and promotional materials was carried out by 10 companies (BASF building materials, s.r.o. Žilina, Doprastav, a.s. Bratislava, Ecoltech, spol. s.r.o. Lučenec, Hilti Slovakia, spol. s.r.o., Bratislava, Izomat, a.s. Nová Baňa, Knauf, s.r.o. Bratislava, Op-tim, spol. s.r.o. Krupina, Rockwool Slovensko, s.r.o. Bratislava, Stavmix Plus, s.r.o. Stupava a Stokat-M, s.r.o. Zvolen). Abstracts of the papers were published in the newly established Delta journal, no. 1, volume I, 2007 ISSN 1337-0863. The full texts of the papers were published on CD-ROM - Proceedings of the 1st International Symposium with Exhibition Teplo-Oheň-Materiály 2007 / Heat-Fire-Materials 2007, ISBN 978-80-228-1719-6.

As a result of the discussions in the different sections, the transfer of latest knowledge and experience on heat and fire caused changes of materials and evaluation and testing methods for materials and products has been passed among research and development centres, universities, accredited testing centres, construction companies and companies with high fire resistance products.

Before the end of the Symposium, the section guarantors, representatives of the International Scientific Committee and expert guarantor assessed the course of the symposium and the level of published papers and contributions presented. They suggested publishing some papers in other Delta journal numbers. They stated that the aim of the symposium had been met. They recommended to address the representatives of participating companies with the requirement to prepare and give lectures for students and teachers at all levels of the Protection of Persons and Property study field at the Faculty of Wood Sciences and Technology of the Technical University in Zvolen. The University representative, the Vice-Rector Danihelová, has positively evaluated the creation of new business and personal contacts, and publishing the abstracts of papers, published in the Proceedings in the Delta journal, that helps bringing the information to a wide range of professional public. The representative of practitioners, the Director of Fire Research Institute (PTEÚ MV SR), Col. Rešetár, pointed out that there were presented many interesting contributions with beneficial knowledge, which can be used in further co-operation in the expertise activities, especially in the context of the fire investigation.

Second year – TOM 2011

The International Scientific Committee of the first year of the event, as one of its evaluation conclusions, recommended that the

Druhý ročník – TOM 2011

Medzinárodný vedecký výbor prvého ročníka podujatia ako jeden zo svojich hodnotiacich záverov odporučil preniesť nasledujúci ročník do priestorov univerzity, aby sa najzaujímavejších prednášok a prezentácií firmami mohol zúčastniť širší okruh záujemcov, s dôrazom na potrebu prenosu informácií priamo od vedeckých a pedagogických pracovníkov a od odborníkov z praxe aj pre ďalších pracovníkov univerzity a študentov študijných programov v odbore Ochrana osôb a majetku. Účasť na takomto podujatí je prínosom najmä pre študentov v externej forme, ktorí pracujú v odboroch blízkyh vedeckému a odbornému zameraniu sympózia. Preto sme sa rozhodli zmeniť miesto konania podujatia na priestory Technickej univerzity vo Zvolene a termín na október, aby sme umožnili zúčastniť sa sympózia nielen všetkým našim kolegom a študentom tretieho stupňa programu Protipožiarna ochrana a bezpečnosť, ale aj našim študentom druhého stupňa v dennej a externej forme.

Druhý ročník sa uskutočnil v priestoroch TU vo Zvolene 13. októbra 2011. Patronát nad druhým ročníkom medzinárodného sympózia TOM 2011 prevzali prof. Ing. Ján Tuček, CSc., rektor Technickej univerzity vo Zvolene a mjr. Ing. Štefan Galla, PhD., riaditeľ Požiaro-technického a expertízneho ústavu MV SR v Bratislave. Členmi medzinárodného vedeckého výboru boli Dr. László Komjáthy - Maďarská republika, doc. Ing. Miroslava Netopilová, CSc. - Česká republika, prof. Ing. Karol Balog, CSc. - Slovenská republika, prof. Ing. Anton Osvald, CSc. - Slovenská republika. Garantom bola doc. RNDr. Danica Kačíková, PhD.

Prednášok podujatia sa zúčastnilo 187 poslucháčov, najmä z radov študentov externej formy všetkých stupňov štúdia v odbore Ochrana osôb a majetku. Prednášajúci z troch krajín (Slovensko, Maďarsko, Česká republika) zaujali nielen aktuálnymi informáciami, ale v diskusii odpovedali aj na otázky ďalšieho smerovania vývoja v oblasti hodnotenia, spracovania a používania materiálov z pohľadu ochrany pred požiarom, ale aj zdoľavania požiarov. Súčasťou podujatia boli aj firemné prezentácie a výstavka výrobkov slovenských firiem, zaoberajúcich sa protipožiarnou ochranou a bezpečnosťou stavieb. Medzinárodná vedecká rada prijala a recenzovala 15 príspevkov, ktoré boli vydané v desiatom čísle časopisu Delta (Delta : vedecko-odborný časopis TU vo Zvolene. Zvolen : Technická univerzita vo Zvolene. ISSN 1337-0863, 2011, vol. V., č. 10, 72 s.), čím sa zvýšila ich prístupnosť širokej vedeckej a odbornej komunite.

Zo zhodnotenia priebehu druhého ročníka sympózia medzinárodným vedeckým výborom vyplynulo, že zmena miesta aj času konania splnila cieľ, ktorým bolo zintenzívnenie výmeny najnovších poznatkov a skúseností medzi akademickým prostredím a praxou v oblasti požiarneho inžinierstva, požiarneho skúšobníctva, hodnotení materiálov a výrobkov, protipožiarnej bezpečnosti stavieb, techniky a taktiky záchranných činností. Odporučila konanie ďalšieho ročníka, ak to bude možné, znovu v priestoroch Technickej univerzity a umožnenie študentom zúčastniť sa prednášok ako významného doplnenia ich prípravy na budúce povolanie.

Tretí ročník – TOM 2015

Príprava tretieho ročníka medzinárodného sympózia sa niesla v presvedčení, že sledovanie najnovších trendov v oblasti protipožiarnej ochrany a bezpečnosti vyžaduje intenzívnu spoluprácu medzi domácimi a zahraničnými vysokoškolskými inštitúciami, strednými

following year should be transferred to the area of the Technical University in Zvolen, so that the most interesting lectures and presentations of the companies could be attended by a wider range of participants, with the emphasis on the need to transfer the information directly from scientific and pedagogical staff, and practitioners to other university staff and students of the Protection of Persons and Property study programs. Participation in such events is particularly beneficial for part-time students who work in fields close to the scientific and professional focus of the symposium. Therefore, we decided to change the venue of the event to the Technical University in Zvolen and the date to October to allow to participate in the symposium not only all our colleagues and students of the third degree of Fire Protection and Safety study program, but also to our second degree students in full-time and part-time study form.

The second year was held at the area of TU in Zvolen on October 13th, 2011. The patronage over the second year of the international symposium TOM 2011 was taken by prof. Ján Tuček, CSc., Rector of the Technical University in Zvolen and Maj. Štefan Galla, PhD., Director of the Fire Research Institute of the Ministry of Interior of the Slovak Republic in Bratislava (PTEÚ MV SR). Members of the International Scientific Committee were Dr. László Komjáthy - Hungary, assoc. prof. Miroslava Netopilová, CSc. - Czech Republic, prof. Karol Balog, CSc. - Slovak Republic, prof. Anton Osvald, CSc. - Slovak Republic. The Guarantor was assoc. prof. Danica Kačíková, PhD.

The lectures of the Symposium were attended by 187 students, especially the part-time students of all levels of study in the study field Protection of Persons and Property. The lecturers from three countries (Slovakia, Hungary, Czech Republic) were interesting not only due to the current information they presented, but in the discussion they also answered the questions related to the further development of the testing, processing and use of materials from the fire protection and fire-fighting point of view. The symposium also included the company presentations and exhibitions of products of Slovak companies dealing with fire protection and safety of buildings. The International Scientific Committee has accepted and reviewed 15 papers, which were published in the 10th issue of the Delta journal (Delta: Scientific and Professional Journal, TU in Zvolen, Zvolen: Technical University of Zvolen, ISSN 1337-0863, 2011, vol. V., no. 10, 72 pp.), thus increasing their accessibility to a broad scientific and professional community.

The evaluation of the course of the second year of Symposium given by the International Scientific Committee showed that the change of the place and time of the symposium organisation met the aim of intensifying the exchange of the latest knowledge and experience between the academic environment and the practice in the area of fire engineering, fire testing, materials and products evaluation, buildings fire safety, equipment and tactics of rescue work. It recommended that the next year of symposium, if possible, should be organised in the area of the Technical University again and also recommended allowing the students to participate in the lectures as an important addition to their preparation for the future employment.

Third year – TOM 2015

The preparation of the third year of the International Symposium was convinced that following the latest trends in fire protection and safety requires intensive co-operation between national and foreign higher education institutions, secondary high schools, testing facili-

školami, skúšobňami, Dobrovoľnou požiarnou ochranou SR a samozrejme Hasičským a záchranným zborom SR, s nezastupiteľnou úlohou osobného kontaktu a brainstormingu.

Teplo-oheň-materiály 2015, 3. ročník medzinárodného sympózia sa uskutočnil 22. -23. novembra 2015 na Technickej univerzite vo Zvolene. Patronát nad ním prevzali prof. Ing. Rudolf Kropil, CSc., prezident Slovenskej rektorskej konferencie, rektor TU vo Zvolene a gen. JUDr. Alexander Nejedlý, prezident HaZZ SR. Členstvo v medzinárodnom vedeckom výbore prijali: prof. Ing. Karol Balog, PhD. – STU v Bratislave, doc. RNDr. Anna Danihelová, PhD. – TU vo Zvolene, pplk. Ing. Štefan Galla, PhD. – PTEÚ MV SR, prof. RNDr. František Kačík, PhD. – TU vo Zvolene, prof. RNDr. Danica Kačíková, PhD. – TU vo Zvolene, prof. Ing. Miroslav Kelemen, PhD., MBA – VŠBM v Košiciach, Dr. László Komjáty – NUPS, Maďarsko, prof. Dr. hab. Inż. Edward Kowal – UZ, Poľsko, doc. Ing. Petr Kučera, PhD. – VŠB-TU Ostrava, Česká republika, doc. Ing. Jana Müllerová, PhD. – ŽU v Žiline, prof. Ing. Anton Osvald, PhD. – ŽU v Žiline, Dr.h.c. mult. Prof. Ing. Juraj Sinay, DrSc. – TU Košice, prof. Ing. Maroš Soldán, PhD. – STU v Bratislave. Vedeckým garantom bola prof. RNDr. Danica Kačíková, PhD.

Celkový počet účastníkov bol 121, z toho 14 zo zahraničia (6 z Českej republiky, 4 z Maďarska a 4 z Poľska). Členovia vedeckej rady oponovali a posudzovali všetky pôvodné vedecké príspevky, ktoré boli uverejnené v zborníku CDrom, 179 s., ISBN 978-80-228-2825-3. Vedecká rada z nich vybrala tie, ktoré boli prednesené ako referáty na rokovaní sympózia. Jednalo sa o najzaujímavejšie a najnovšie informácie a skúsenosti vedeckých, výskumných a skúšobných pracovníkov, výrobcov, ako aj členov HaZZ, o správaní sa a zmenách konštrukčných materiálov, kompozitov a výrobkov z nich za zvýšených teplôt pri požiari. Najživšia diskusia vyvolali referáty „Zdravotní a environmentální rizika vybraných zpomalovačů hoření“ a možnosti aplikácie prístrojov firmy Hermes Labsystems, s. r. o. v príspevku „Štúdium protipožiarnej vlastností materiálov“. Vybraných referátov sympózia sa zúčastnili aj študenti odboru Ochrana osôb a majetku zo Strednej odbornej školy drevárskej Zvolen. Jednalo sa o témy, ktoré doplnili preberanú látku na odborných predmetoch ich štúdia. To upevnilo spoluprácu KPO DF TU vo Zvolene s uvedenou strednou školou a bolo tiež propagáciou študijných programov na univerzite.

V záverečnom vyhodnotení sympózia vystúpil v mene medzinárodného vedeckého výboru prof. Balog. Poďakoval všetkým zúčastneným a organizátorom a konštatoval, že podujatie aj spolu so sprievodným programom bolo úspešné a vyjadril presvedčenie, že úspešný a prínosný bude aj jeho plánovaný nasledujúci ročník.

Záver

Na základe našich doterajších skúseností a ohlasov na podujatia TOM predpokladáme pokračovanie v organizovaní jeho ďalších ročníkov v spolupráci s medzinárodne uznávanými odborníkmi z akademickej sféry ale aj z praxe, t.j. HaZZ SR.

prof. RNDr. Danica Kačíková, PhD.,
vedecký garantom medzinárodných sympózií TOM,
Katedra protipožiarnej ochrany, Drevárska fakulta TUZVO

ties, Voluntary Fire Protection of the Slovak Republic and the Fire and Rescue Service of course, with an irreplaceable role of personal contact and brainstorming.

Teplo-oheň-materiály 2015 / Heat-Fire-Materials 2015, the 3rd International Symposium took place at the Technical University in Zvolen on November 22nd – 23rd. The patronage was taken over by prof. Rudolf Kropil, PhD., President of the Slovak Rector's Conference, Rector of TU in Zvolen and gen. Alexander Nejedlý, President of Fire and Rescue Service. The membership in the International Scientific Committee accepted: prof. Karol Balog, PhD. - STU in Bratislava, assoc. prof. Anna Danihelová, PhD. - TU in Zvolen, Lt. col. Štefan Galla, PhD. - PTEU MV SR, prof. František Kačík, PhD. - TU in Zvolen, prof. Danica Kačíková, PhD. - TU in Zvolen, prof. Miroslav Kelemen, PhD., MBA – University of Security Management in Košice, Dr. László Komjáty - NUPS, Hungary, prof. Dr. hab. Edward Kowal - UZ, Poland, assoc. prof. Petr Kučera, PhD. - VŠB-TU Ostrava, Czech Republic, assoc. prof. Jana Müllerová, PhD. - ŽU in Žilina, prof. Anton Osvald, PhD. - ŽU in Žilina, Dr.h.c. mult. Prof. Juraj Sinay, DrSc. - TU Košice, prof. Maroš Soldán, PhD. - STU in Bratislava. The Scientific Guarantor was prof. Danica Kačíková, PhD.

The total number of participants was 121, of which 14 were from abroad (6 from the Czech Republic, 4 from Hungary and 4 from Poland). The members of the Scientific Committee opposed and reviewed all original scientific papers that were published in the CD-ROM proceedings, 179 pp., ISBN 978-80-228-2825-3. The Scientific Committee chose those that were presented as contributions on symposia. Those presented the most interesting and up-to-date information and experience of scientific, research and testing staff, manufacturers and members of the Fire and Rescue Service about the behaviour and changes of structural materials, composites and products made at increased temperatures during a fire. The most controversial discussions were the “Health and Environmental Risks of Selected Flame Retardants” and the Hermes Labsystems, Ltd. appliance applications, presented in the paper “Study of fire properties of materials”. Selected symposium contributions were attended by students of the Protection of Persons and Property Protection from the Wood Industry Vocational School in Zvolen. Those were the topics that completed the knowledge learned in the vocational subjects of their study. This strengthened the co-operation of DFP FWST TU in Zvolen with the above-mentioned vocational school and was also a promotion of study programs at the university.

In the final evaluation of the Symposium spoke professor Balog on behalf of International Scientific Committee. He thanked all the participants and organizers and noted that the event also with the accompanying program was a success and expressed the conviction that also the next year of symposium will be successful and beneficial.

Conclusion

Based on our previous experience and feedback on TOM events, we expect the continuation of organizing its next years in co-operation with internationally recognized experts, coming as from academics as from practice, i.e. Fire and Rescue Service.

Professor Danica Kačíková, PhD.,
Scientific Guarantor of the TOM International Symposia,
Department of Fire Protection,
Faculty of Wood Sciences and Technology TUZVO



TOM 2007 – Pohľad do výstavnej kóje (firma HILTI) / TOM 2007 - A view of the exhibition booth (HILTI)



TOM 2011 – V prednáškovej miestnosti / TOM 2011 – In the Conference Room



TOM 2007 – Z rokovania sekcie (zľava: prof. Ing. Anton Osvald, CSc. – vedúci KPO, plk. Ing. Ján Rešetár – riaditeľ PTEÚ MV SR v Bratislave, doc. RNDr. Danica Kačíková, PhD. – garant konferencie) / TOM 2007 – Session discussions (from left: prof. Anton Osvald, PhD. - Head of DFP, col. Ján Rešetár - Director of PTEÚ MV SR in Bratislava, assoc. prof. Danica Kačíková, PhD. - Guarantor of the Conference)



TOM 2015 – Plenárne prednášky / TOM 2015 - Plenary lectures



TOM 2011 – Otvorenie rokovania (sprava: prof. Ing. Ján Tuček, CSc. – rektor TUZVO, doc. RNDr. Danica Kačíková, PhD. – garant konferencie, prof. Ing. Mikuláš Siklienka, PhD. – dekan DF, pplk. Ing. Štefan Galla, PhD. – riaditeľ PTEÚ MV SR) / TOM 2011 – Opening the Conference (from right: prof. Ján Tuček, CSc. – Rector of the TUZVO, assoc. prof. Danica Kačíková, PhD. – Guarantor of the Conference, prof. Mikuláš Siklienka, PhD. – Dean of the FWST, Lt. Col. Štefan Galla, PhD. – Head of the PTEÚ MV SR)



TOM 2015 – účastníci posterovej sekcie (zľava: Ing. Eva Mračková, PhD. – KPO, Ing. Jozef Martinka, PhD. – vedúci katedry, MŤF v Trnave, Ing. Ludmila Tereňová, PhD. – KPO, Ing. Emília Orémusová, PhD. – KPO) / TOM 2015 - participants of the poster section (from left: Eva Mračková, PhD - DFP, Jozef Martinka, PhD. - Head of the department, MŤF in Trnava, Ludmila Tereňová, PhD. - DFP, Emília Orémusová, PhD. - DFP)

MEDZINÁRODNÁ KONFERENCIA HASIČSKÉ JEDNOTKY INTERNATIONAL CONFERENCE "FIRE UNITS"

Predchodcom medzinárodnej konferencie Hasičské jednotky bolo vedecko-odborné kolokvium s témou Hasičské jednotky. Prvé sa konalo pri príležitosti Hasičskej nedele v Martine – Priekope 13. mája 2012. Iniciátorom akcie bol DHZM Martin a KPO DF TU vo Zvolene. Na tomto podujatí po prvý krát oficiálne zaznela požiadavka reorganizácie hasičských jednotiek, pôsobiach na obciach. Po prvý krát sa začalo, medzi dobrovoľnými hasičmi, hovoriť o kategorizácii týchto zborov. Logickým pokračovaním bolo druhé kolokvium s názvom Hasičské jednotky 2012. Toto sa konalo 5. decembra 2012 na pôde TU vo Zvolene. Organizátorom bola Katedra protipožiarnej ochrany DF TU vo Zvolene a Katedra verejnej správy a krízového manažmentu Akadémie PZ v Bratislave. Podnetom k zvolaniu bola otázka obnovenie funkčnosti a akcieschopnosti obecných hasičských zborov a aktivácia organizačnej členskej základne DPO SR a jej organizačných štruktúr v rámci zásahovej činnosti hasičských jednotiek. Tieto požiadavky vychádzali z Programového vyhlásenie vlády SR na roky 2012-2016, v ktorom sa, v časti Vnútorný poriadok a bezpečnosť, okrem iného uvádza: „Vláda masívnejšie podporí spoluprácu s dobrovoľnými hasičskými zbormi, aby bol využitý potenciál tisícov ich členov, ktorí sú okamžite pripravení pomáhať pri ochrane života, zdravia a majetku.“

Kým podstatou prvého stretnutia v Martine počas Hasičskej nedele 13. mája 2012 boli možnosti prehodnotenia základných kritérií pre zriadenie hasičských jednotiek na obciach, spojené s ich kategorizáciou, obsahom stretnutia vo Zvolene bola otázka personálneho zabezpečenia týchto jednotiek, možnosti zmeny legislatívy a podpora financovania pri ich zriadení a prevádzkovaní.

Zo záverov obidvoch kolokvií vyplynulo, že je potrebné, v rámci presadzovania jednotnej politiky v oblasti obecných hasičských zborov, zabezpečiť podujatie so širšou organizačnou platformou, ale aj s možnosťou aplikácie záverov do platných právnych predpisov.

Toto bola základná myšlienka, na ktorej bola postavená vedecko – odborná konferencia Hasičské jednotky 2014. Táto sa konala v Martine, 25. apríla 2014. Potreba zvolania konferencie s týmto obsahom vychádzala z prijatého zákona č. 37/2014 Z. z. o Dobrovoľnej požiarnej ochrane Slovenskej republiky a z realizácie Návrhu celoplošného rozmiestnenia síl a prostriedkov hasičských jednotiek na území Slovenskej republiky. Po prvý krát organizátormi konferencie boli KPO DF TU vo Zvolene, DPO SR a HaZZ MV SR. Záštitu nad konferenciou prevzal podpredseda vlády Slovenskej republiky, minister vnútra Slovenskej republiky JUDr. Róbert Kaliňák. Táto konferencia mohla deklarovať jednotu vo všetkých formách úsilia hasičov bez rozdielu zriaďovateľa hasičskej jednotky. Vedeckosť, zastúpenú členmi vedeckého výboru z akademickej obce, z Technickej univerzity vo Zvolene a Žilinskej univerzity v Žiline, profesionalitu, úzko spojenú so špecializovanou štátnou správou, zastúpenú vo vedeckom výbore vedením HaZZ MV SR a hosťom z GR HZS MV ČR, dobrovoľnosť, zastúpenú vo vedeckom výbore vedením DPO SR, ale najmä záujem o riešenie problémov, ktorý bol prezentovaný účasťou 453 priamych účastníkov.

The forerunner of the International Conference "Fire Units" was the scientific and professional colloquium with the theme of Fire Units. The first colloquium was held on the occasion of Fire-Fighting Sunday in Martin - Priekopa on 13.05.2012. The initiator of the event was the Martin Municipality Voluntary Fire Brigade and Department of Fire Protection, Faculty of Wood Sciences and Technology of the Technical University in Zvolen. For the first time, at this event, there was officially voiced a requirement for reorganization of fire units operating in municipalities. First time, the volunteer firefighters, began to talk about the categorization of those units. A logical continuation was the second colloquium entitled "Fire Units 2012". This took place at the area of the Technical University in Zvolen on 5.12.2012. The organizer was the Department of Fire Protection, Faculty of Wood Sciences and Technology of the Technical University in Zvolen and the Department of Public Administration and Crisis Management of the Academy of Police Force in Bratislava. The impulse for the convening was the issue of restoring the functionality and capability of municipality fire brigades and activation of organizational membership base of the Voluntary Fire Protection of the Slovak Republic and its organizational structures in the framework of the fire brigades intervention activities. These requirements were based on the Program Declaration of the Government of the Slovak Republic for the years 2012-2016, in which, in the part "Internal Order and Security", inter alia: "The government will more massive support the co-operation with the voluntary fire brigades to use the potential of thousands of their members who are immediately ready to assist in the protection of life, health and property".

While the core of the first meeting in Martin, during the Fire-Fighting Sunday on 13.05.2012, was the option of reconsidering the basic criteria for the establishment of fire brigades at the municipalities, related to their categorization, the content of the meeting in Zvolen was the issue of staffing of those units, the possibility of changing legislation and funding support for their establishment and operation.

The conclusions of both colloquia showed that it is necessary, in the context of promoting a uniform policy on municipal fire brigades, to ensure the event with the wider organizational platform, but also with the possibility of implementation of the conclusions into the existing legislation.

This was the basic idea, on which the scientific and professional conference "Fire Units 2014" was built. This took place in Martin, on 25.04.2014. The need for convening a conference with the following content was based on the adopted Law no. 37/2014 Coll. about the Voluntary Fire Protection of the Slovak Republic and implementation of the Proposal of the Nationwide Deployment of Forces and Means of Fire Brigades in Slovakia. For the first time, the Department of Fire Protection, Faculty of Wood Sciences and Technology of the Technical University in Zvolen, Voluntary Fire Protection of the Slovak Republic and Fire and Rescue Service of the Ministry of Interior

Hlavnou témou konferencie HASIČSKÉ JEDNOTKY 2015, konanej 27. júna 2015 bola BOZP pri činnostiach hasičských jednotiek a ochrana hasiča pri zásahu – používanie osobných ochranných pracovných prostriedkov. Konferencia, s tradičnými usporiadateľmi, bola opäť pod záštitou JUDr. Róberta Kaliňáka.

Problematika hasičských jednotiek v zriaďovacej kompetencii samosprávy sa stala témou vedecko – odbornej konferencie „Hasičské jednotky 2016“ aj po piaty krát. Usporiadatelia, ktorými boli tradične DOBROVOLNÁ POŽIARNA OCHRANA SLOVENSKEJ REPUBLIKY, HASIČSKÝ A ZÁCHRANNÝ ZBOR SLOVENSKEJ REPUBLIKY a KATEDRA PROTIPOŽIARNEJ OCHRANY DF TECHNICEJ UNIVERZITY VO ZVOLENE vybrali za hlavnú tému konferencie Vzdelávanie a výcvik v hasičských jednotkách vo vzťahu ku kategórii DHZO.

Oproti minulosti, termín konania konferencie bol presunutý z jarných mesiacov na 8. októbra 2016. Hostiteľom sa už po tretí krát stala Spojená škola na Ulici Červenej armády 25 v Martine. Pre vyše 300 účastníkov konferencie bolo pripravených 12 prednášok k piatim tematickým okruhom, ktorými boli:

1. Kategorizácia hasičských jednotiek – požiadavky na akcie-schopnosť vo vzťahu k dotácii.
2. Plošné pokrytie a poplachový plán.
3. Vzdelávanie a výcviková dokumentácia.
4. Výcvikové centrum HaZZ Lešť – skúsenosti s výcvikom DHZO.
5. Zvolávacie systémy využiteľné pre potreby DHZO, DHZM.

Základné problémy, vyplývajúce z diskusie je možné rozdeliť do niekoľkých skupín:

- Využitie dotácií.
- Možnosť financovania pobytu vo VC HaZZ z dotácií.
- Ďalšie možnosti prídelenia hasičskej techniky zo strany HaZZ a štátu.
- Rekonštrukcia hasičských vozidiel.
- Možnosti refundácie mzdy pri zásahovej činnosti.
- Mýta pre hasičské vozidlá.
- STK a EK vo vzťahu k starým hasičským vozidlám, periodicita a normy (Š 706 RTHP a pod.).
- Riziká práce členov DHZO z pohľadu bezpečnosti a ochrany zdravia, pracovná zdravotná služba a sociálne poistenie.
- Poistenie za škody pri vykonávaní činnosti DHZO.
- Medzirezortné riešenie nedostatku vodičských preukazov skupiny „C“ a ich získavania pre potreby DHZO.
- Systém kontroly DHZO zo strany KR HaZZ v spolupráci s KV DPO SR.

Organizátori konferencie pripravili, ako tradične z konania konferencie zborník prezentácií spolu s audio záznamom, ktorý sa dá využiť pri odborných prípravách v rámci vzdelávania hasičských jednotiek.

Mgr. Ing. Ivan Chromek, PhD.

Článok vznikol vďaka podpore 012TU Z-4/2016 Tvorba inovatívnych vysokoškolských učebníc a pomôcok pre študijné programy Proti-požiarna ochrana a bezpečnosť a integrovaná bezpečnosť.

of the Slovak Republic were the organizers of the Conference. The patronage over the conference took the Slovak Deputy Prime Minister, Minister of Interior of the Slovak Republic - Róbert Kaliňák. This conference could declare unity in all forms of the efforts of firefighters without the differences in the founder of the fire brigade. Scientism, represented by members of the scientific committee from the academic community, from the Technical University in Zvolen and the University of Žilina in Žilina, professionalism, closely associated with the specialized state administration, represented in the Scientific Committee, leaders from the Fire and Rescue Service of the Ministry of Interior and guests from the Fire and Rescue Service Directorate General of the Ministry of Interior of the Czech Republic, voluntary, represented in scientific committee by the leaders of the Voluntary Fire Protection of the Slovak Republic, but particularly an interest in solving the problems, which was presented by the participation of 453 direct participants.

The main topic of the conference “Fire Units 2015”, which was held on 27.06.2015, the was Occupational Health and Safety in intervention activities of fire brigades and fire-fighter protection in intervention - use of personal protective equipment. The Conference, with the traditional organizers, was organised under the patronage of Róbert Kaliňák again.

The issue of fire brigades in establishing competence of the local government has become a topic of scientific and professional conference “Fire Units 2016”, for the fifth time. Organizers, which were traditionally the Voluntary Fire Protection of the Slovak Republic, Fire and Rescue Service and Department of Fire Protection, Faculty of Wood Sciences and Technology of the Technical University in Zvolen, chosen as the main topic of the Conference “Education and Training of Fire Brigades in Relation to the Category of Municipality Voluntary Fire Brigade.

Compared with the past, the term of the conference was moved from the spring months to 8.10.2016. The Spojena škola in the Červenej armády 25 Street in Martin hosted the Conference for the third time.

For more than 300 participants, there were prepared 12 lectures on five thematic areas, namely:

1. Categorization of fire brigades – requirement for operational capability in relation to subsidies, area wide coverage and alarm plan.
2. Flat coverage and alarm plan.
3. Education and training documentation.
4. Lest Fire and Rescue Service Training Centre - experience with training of the municipality Voluntary Fire Brigades.
5. Assembly systems usable for the needs of the Municipality Voluntary Fire Brigades.

Basic issues arising from the discussion can be divided into several groups:

- The use of subsidies.
- The possibility of financing stay at the Lest Fire and Rescue Service Training Centre from the subsidies.
- Other options for the allocation of fire-fighting equipment from the



Obr. 1 Plk. Dr. Ing. Zdeněk Hanuška z GŘ HZS ČR při přednášce v rámci programu „Hasičské jednotky 2012“
 Fig. 1 Col. Dr. Zdeněk Hanuška from the General Directorate of the Fire and Rescue Service of the Czech Republic giving a lecture during the “Fire Units 2012” seminar

Fire and Rescue Service and the state.

- Reconstruction of the fire-fighting vehicles.
- Wages reimbursement options for the intervention activities.
- Tolls for the fire-fighting vehicles.
- Technical controls and the emission controls in relation to an old fire-fighting vehicles, periodicity and standards.
- Risks in work of the Municipality Voluntary Fire Brigades members in terms of health and safety, occupational health services and social insurance.
- Insurance for damages occurred in carrying out the Municipality Voluntary Fire Brigade activities.
- Interdepartmental addressing the lack of driving licenses of "C" category and their obtaining for the needs of the Municipality Voluntary Fire Brigades.
- Municipality Voluntary Fire Brigades control system by the Regional Directorate of the Fire and Rescue Service in collaboration with Regional Committee of the Voluntary Fire Protection of the Slovak Republic.

The Conference organizers have prepared, as traditionally, a Conference Proceedings of presentations from the Conference, together with audio record that can be used in education and training process of fire brigades.

Ing. Mgr. Ivan Chromek, PhD.

*The paper was prepared with the support of 012TU Z-4/2016
 “Development of innovative university textbooks and instruments for study programs Fire Protection and Safety and Integrated Safety.*

ADVANCES IN FIRE & SAFETY ENGINEERING

INFORMÁCIE O MEDZINÁRODNEJ VEDECKEJ KONFERENCII „AFSE“ INFORMATION ABOUT THE INTERNATIONAL SCIENTIFIC CONFERENCE “AFSE”



Katedra protipožiarnej ochrany sa podieľa na organizovaní množstva vedecko – odborných podujatí, ktoré úzko súvisia s profilovým zameraním katedry v oblasti výskumu a rozvoja protipožiarnej ochrany a bezpečnosti. Z dôvodu sprostredkovania najnovších informácií a trendov v rôznych oblastiach bezpečnosti vyplynula požiadavka na organizovanie medzinárodnej vedeckej konferencie s názvom „Advances in Fire & Safety Engineering“ (Pokrok v požiarnom a bezpečnostnom inžinierstve). História konferencie sa začala písať v roku 2012, čím sa AFSE radí medzi najmladšie podujatia na KPO ale zato s najširším záberom v danej oblasti.

V trojročnom cykle je hlavným organizátorom menovaného podujatia Katedra protipožiarnej ochrany, Drevárska fakulta, Technická univerzita vo Zvolene, po iné roky je spoluorganizátorom. V ďalších rokoch organizačne konferenciu zabezpečuje Ústav bezpečnosti, environmentu a kvality, Materiálovotechnologickej fakulty so sídlom v Trnave, Slovenskej technickej univerzity v Bratislave a Katedra požiarneho inžinierstva, Fakulta bezpečnostného inžinierstva Žilinskej Univerzity v Žiline. Na konferencii participujú každoročne zástupcovia zo spolupracujúcich univerzít zo Slovenska a zo zahraničia, z prostredia praxe je to hlavne Hasičský a záchranný zbor SR, Požiarnotechnický a expertízny ústav Ministerstva vnútra SR, Slovenská asociácia hasičských dôstojníkov, Združenie požiarneho inžinierstva a European Science and Research Institute.

Počas organizovania konferencie na pôde TU vo Zvolene prevzali nad konferenciou patronát rektor Technickej univerzity vo Zvolene, prof. Ing. Rudolf Kropil, CSc., prezident Hasičského a záchranného zboru SR, gen. JUDr. Alexander Nejedlý, PhD., prezident Dobrovoľnej požiarnej ochrany SR, PhDr. Ladislav Pethö, riaditeľ Požiarnotechnického a expertízneho ústavu MV SR, pplk. Ing. Štefan Galla, PhD., a riaditeľ Krajského riaditeľstva Hasičského a záchranného zboru v Banskej Bystrici, plk. Ing. Dušan Slúka.

Cieľom podujatia je každoročné sprostredkovanie a výmena informácií v oblasti protipožiarnej ochrany, bezpečnosti a ochrany zdravia pri práci, nadviazanie nových kontaktov s ostatnými domácimi, ale aj zahraničnými univerzitami a zástupcami praxe, ako aj prezentovanie najnovších výsledkov vedecko-výskumných úloh a činností realizovaných účastníkmi podujatia.

Konferencie sa pravidelne zúčastňujú zástupcovia akademickej pôdy zo slovenských univerzít, konkrétne zo Slovenskej technickej univerzity v Bratislave, Akadémie Policajného zboru v Bratislave, Slovenskej poľnohospodárskej univerzity v Nitre, Žilinskej univerzity v Žiline, Technickej univerzity v Košiciach, ale aj zástupcovia zahraničných partnerských univerzít z Českej republiky (Vysokej

Department of Fire Protection is involved in organizing a number of scientific - professional events that are closely related to the profile of the Department in the sphere of research and development of Fire Protection and Safety. Due to intermediation of the latest information and trends in different areas of safety, there arose requirement to organize an international scientific conference titled “Advances in Fire & Safety Engineering”. The history of the conference started in 2012, thus the AFSE Conference belong among the youngest event of the Department of Fire Protection, but with the widest scope in this area.

In the three-year cycle is the main organizer of the Conference the Department of Fire Protection, Faculty of Wood Sciences and Technology, Technical University in Zvolen, another years is the co-organizer. In another years, the organization of the Conference is provided by the Institute of Integrated Safety, Faculty of Materials Science and Technology in Trnava of the Slovak University of Technology in Bratislava and the Department of Fire Engineering, Faculty of Security Engineering, University of Zilina. At the conference, there every year participate the representatives from co-operating universities in Slovakia and abroad, from the practice it is in particular the Fire and Rescue Service, Fire Research Institute of the Ministry of Interior, Slovak Association of Fire Officers, Association of Fire Engineering and European Science and Research Institute.

While organizing the conference on the ground of the Technical University in Zvolen, the patronage over the Conference took the rector of the Technical University in Zvolen - professor Rudolf Kropil, PhD., President of the Fire and Rescue Service - general Alexander Nejedlý, PhD., President of the Voluntary Fire Protection of the Slovak Republic - Ladislav Pethö, Director of the Fire and Research Institute of the Ministry of Interior - Lieutenant colonel Štefan Galla, PhD., MBA, and Director of the Regional Directorate of the Fire and Rescue Service in Banská Bystrica - col. Dušan Slúka.

The aim of this event is an annual negotiation and exchange of information in the field of fire protection, health and safety at work, establishing new contacts with other home as well as foreign universities and representatives of practice, as well as presenting the latest results of scientific and research projects and activities implemented by the participants of the event.

The Conference is regularly attended by representatives of Slovak academic institutions, especially from the Slovak University of Technology in Bratislava, Academy of Police Force in Bratislava, Slovak University of Agriculture, University of Zilina, Technical University of Kosice, but also representatives of foreign partner universities from the Czech Republic (VSB - Technical University

školy báňskej – Technickej univerzity v Ostrave a Vysoké učení technické v Brne), Poľska (University of Zielona Góra – v Zelenej Hore) a Maďarska (National University of Public Service – v Budapešti). Zástupcovia štátnej správy, príslušníci Hasičského a záchranného zboru SR, Hasičského záchranného sboru ČR, konkrétne z Technického ústavu požární ochrany, Ministerstva obrany SR ako aj zástupcovia odbornej praxe a sponzorov. Okrem vyššie uvedených sa konferencie pravidelne zúčastňujú aj študenti denného a externého štúdia. Za posledných päť ročníkov organizovania konferencie sa jej zúčastnilo viac ako 500 účastníkov zo Slovenska a zo zahraničia.

Po posúdení jednotlivých príspevkov medzinárodným vedeckým výborom, zloženým z domácich a zahraničných odborníkov v jednotlivých vedeckých oblastiach, každoročne vychádza zborník vedeckých prác s názvom *Advances in Fire & Safety Engineering*. V zborníku sú uverejňované príspevky, ktoré tematicky spadajú do oblasti protipožiarnej ochrany a bezpečnosti.

in Ostrava and Brno University of Technology), Poland (University of Zielona Góra) and Hungary (National University of Public Service in Budapest). And the state authorities representatives, members of the Fire and Rescue Service of the Slovak and Czech Republic, particularly from the Technical Institute of Fire Protection, representatives of the Ministry of Defence of the Slovak Republic as well as representatives of professional practice and sponsors. In addition to the above mentioned, the Conference is also regularly attended by full-time and part-time students. Over the past five years of organizing the Conference, it has been attended by over 500 participants from Slovakia and abroad.

After considering of the individual contributions by the international scientific committee, composed of local and foreign experts in various scientific fields, there is every year issued a Proceedings of scientific papers entitled *Advances in Fire & Safety Engineering*. In the Proceedings are published contributions that thematically are related to the area of fire protection and safety



Obr. 1 Otvorenie konferencie AFSE 2015 a TOM 2015

Fig. 1 Opening ceremony of the AFSE 2015 and TOM 2015 Conference

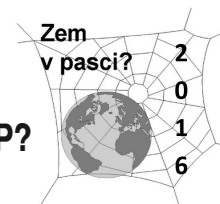
Naše poďakovanie patrí garantom jednotlivých sekcií, členom medzinárodného vedeckého výboru, sponzorom, celému organizačnému výboru a v neposlednom rade všetkým účastníkom na doterajších ročníkoch. Na záver Vás srdečne pozývame na šiesty ročník *Advances in Fire & Safety Engineering 2017*, ktorý sa bude konať v priestoroch Ústavu bezpečnosti, environmentu a kvality, MTF, STU Bratislava, v termíne 19. - 20. 10. 2017.

Martin Zachar
za Vedecký a Organizačný
výbor AFSE

Our thanks go to the guarantors of the individual sections, members of the International Scientific Committee, sponsors, the whole Organising Committee and last but not least to all participants of the Conference in previous years. Finally, we kindly invite you to the 6th year of the *Advances in Fire & Safety Engineering 2017* Conference, which will be take place at the Institute of Integrated Safety, Faculty of Materials Science and Technology in Trnava of the Slovak University of Technology in Bratislava in period 19. - 20. 10. 2017.

Martin Zachar
AFSE Scientific and Organising Committee

MEDZINÁRODNÁ VEDECKÁ KONFERENCIA ZEM V PASCÍ? INTERNATIONAL SCIENTIFIC CONFERENCE EARTH IN A TRAP?



V septembri 2016 sa konal IV. ročník medzinárodnej vedeckej konferencie **Zem v pasci?**, ktorej hlavným organizátorom sa stala Katedra protipožiarnej ochrany v spolupráci s Katedrou chémie a chemických technológií a Katedrou environmentálneho inžinierstva.

Konferencia **Zem v pasci?** začala písať svoju históriu v roku 2006 prvým ročníkom, ktorý sa konal v krásnom prostredí Nízkych Tatier v Krpáčove. Zámerom organizátorov konferencie s podtitulom "*Analýza zložiek životného prostredia*" bolo vytvoriť fórum pre výmenu poznatkov a diskusiu odborníkov v oblasti riešenia problémov životného prostredia. Podujatie zaujalo mnohých odborníkov z oblastí vedy, výskumu aj praxe, ktorí privítali možnosť zoznámiť sa s rôznymi pohľadmi na problematiku analýzy zložiek životného prostredia. Kladný ohlas vyvolalo najmä vytvorenie priaznivej rokovacej atmosféry vďaka zvolenému prostrediu, ktoré poskytovalo možnosť prezentovať diskutované problémy takmer priamo na mieste.

Myšlienku súladu príjemného prostredia a širokého diskusného fóra sa organizátori rozhodli rozvíjať aj počas ďalších ročníkov 2008 a 2010, čo sa odzrkadlilo na stúpajúcom počte účastníkov a mnohých pozitívnych ohlasoch. Príspevky z konferencie boli okrem konferenčných zborníkov zverejnené aj vo vedeckých časopisoch organizujúcich fakúlt *Acta facultatis xylogologiae* a *Acta facultatis ecologiae*.

Napriek úspešnému štartu sa konferencia z organizačných dôvodov odmlčala.

In September 2016, was hold the 4th year of the International scientific conference Earth in a Trap?, which main organizer became the Department of Fire Protection in cooperation with the Department of Chemistry and Chemical Technology and the Department of Environmental Engineering.

The Conference Earth in a Trap became write its history by the 1st year in 2006, which was hold in Krpáčovo, the beautiful Low Tatras territory.

The aim the organizers of the Conference, subtitled "The analysis of the environment components" was to create a forum for the exchange of knowledge and discussion of experts related to solving the environmental problems. The event attracted many experts from science, research as well as practice, who welcomed the opportunity to become acquainted with different views on the issue of the analysis of the environment components. Positive response triggered particularly the creation of a favourable negotiating atmosphere, thanks to the chosen environment, which provided the opportunity to present the issues discussed almost on the spot.

The idea of the compliance of pleasant environment and a wide discussion forum, the organizers decided further to develop during the years 2008 and 2010, which was reflected in the increasing number of participants and positive comments. Conference contributions were published, in addition to conference proceedings also in the scientific journals of organizing faculties *Acta Facultatis Xylogologiae* and *Acta Facultatis Ecologiae*.



Obr. 1 Účastníci konferencie Zem v pasci? 2010 pred hotelom Sitno vo Vyehniach
Fig. 1 The participants of the Earth in a Trap? 2010 Conference in the front of the Sitno Hotel in Vyhne

V roku 2016 sa k organizačnému tímu pridala aj Katedra protipožiarnej ochrany a započala sa nová éra konferencie *Zem v pasci?* s podtitulom *Aplikácie moderných analytických metód v environmentálnom a požiarom inžinierstve*. Organizátori sa rozhodli pokračovať v trende minulých ročníkov a poskytnúť možnosť účastníkom z vedeckej, výskumnej, pedagogickej komunity, no i odborníkom z praxe rokovať o problémoch v oblasti využívania moderných analytických metód v požiarom a environmentálnom inžinierstve, poukázať na problémy pri vývoji nových metód, inovácii klasických a ich aplikáciách, tak aby vyhovovali potrebám vedy i praxe. Účastníci ocenili najmä spojenie viacerých uhlov pohľadov na problémy aplikácií analytických metód v požiarom a environmentálnom inžinierstve. Daný fakt poskytuje možnosti spolupráce na rôznej úrovni, kladie predpoklady využitia dosiahnutých vedeckých a výskumných poznatkov v praktickom živote a umožňuje zohľadňovať potreby praxe so smerovaním výskumných projektov.

Počas štyroch ročníkov sa na konferencii *Zem v pasci?* stretli odborníci zo 6 krajín (Slovensko, Česko, Maďarsko, Poľsko, Srbsko, Lotyšsko), odznelo viac ako 120 prednášok v slovenskom, českom a anglickom jazyku, bolo prezentovaných 60 posterov.

Organizačný aj Vedecký výbor si kladie do budúcnosti za cieľ pokračovať v príprave podujatia, poskytovať možnosť v priateľskom rokovanom ovzduší prezentovať najnovšie výsledky výskumu a diskutovať o aktuálnych problémoch z oblastí ochrany životného prostredia, protipožiarnej ochrany osôb a majetku, zisťovania príčin vzniku požiarov, testovania nových materiálov, hodnotenia environmentálnych dopadov priemyselných a dopravných havárií alebo priemyselnej a poľnohospodárskej činnosti.

Srdečne Vás pozývame na konferenciu *Zem v pasci? 2018: Aplikácie moderných analytických metód v environmentálnom a požiarom inžinierstve*.

Veronika Velková
za Vedecký a Organizačný výbor

Despite the successful start, the conference had paused due to the organizational reasons. In 2016, the origin organizing team was completed with the Department of Fire Protection and began a new era of the Conference *Earth in a Trap?* subtitled “Applications of modern analytical methods in environmental and fire engineering. The organizers have decided to continue in the trend of previous years and provide an opportunity for participants from the scientific, research, educational communities, but also practitioners to discuss the problems related the use of modern analytical methods in fire and environmental engineering, highlight the difficulties in developing new methods, innovation of classic methods and their applications and to meet the needs of science and practice. The participants appreciated the connection of multiple viewpoints on issues of applications of analytical methods in the fire and environmental engineering. This fact provides opportunities for co-operation at various levels, opens preconditions related to use of the scientific and research findings in practical life and allows to take into account the needs of practice with of focus of research projects.

During the four years of the *Earth in a Trap?* Conference, there have met the experts from 6 countries (Slovakia, Czech Republic, Hungary, Poland, Serbia, Latvia). More than 120 lectures was given in Slovak, Czech and English language, 60 posters were presented.

For the future, the Organising and Scientific Committee puts the aim to continue in preparing of the event, providing the opportunity of a friendly negotiation atmosphere, presenting the latest research results and discussing current issues in the field of environmental protection, fire protection of persons and property, fire investigation, testing new materials, evaluation of the environmental impact of industrial and traffic accidents or industrial and agricultural activities.

We kindly invite you to the conference *Earth in a Trap? 2018: Application of modern analytical methods in environmental and fire engineering*.

Veronika Velková
Scientific and Organising Committee

DOBROVOLNÝ HASIČSKÝ ZBOR TECHNICKÁ UNIVERZITA VO ZVOLENE

VOLUNTARY FIRE BRIGADE OF THE TECHNICAL UNIVERSITY IN ZVOLEN

Vznik

26. februára 2003

Stručná história a činnosť

DHZ TU vo Zvolene je organizačne zaradený do Územnej organizácie DPO SR Detviasko – Zvolenskej, ale má aj vlastný štatút občianskeho združenia, zaregistrovaného na MV SR.

Ide o najstarší univerzitný zbor v novodobej histórii Slovenska. Hlavným cieľom zboru je praktická príprava jeho členov v duchu stanov DHZ TU vo Zvolene a právnych predpisov z oblasti ochrany pred požiarimi. Zámerom je budovať, organizovať a zdokonaľovať dobrovoľné hasičstvo. V rokoch 2013- 2015 bol DHZ TU vo Zvolene zaradený do kategórie „C“ DHZO. Zmenou právnych predpisov došlo k jeho vyradeniu z kategorizácie DHZO, ale napriek tomu sa zbor naďalej podieľa na zabezpečení výcviku hasičských jednotiek vo VC HaZZ Lešť. V prípade potreby je pripravovaný na základe vyžiadania KR HaZZ k pomoci občanom v rámci Banskobystrického kraja. Za túto činnosť je v súčasnom období dotovaný z prostriedkov DPO SR vo výške dotácie pre DHZO kategória „C“. Zbor vo svojej činnosti v spolupráci s katedrou rozvíja novodobé tradície hasičstva na univerzitnej pôde, medzi ktoré patria spoločenské podujatia Prijímanie študentov do Cechu hasičského, študentské hasičské plesy a rošambá, ale aj športové súťaže, napríklad v kategórii TFA (najtvrdšie hasičské prežitie), medzinárodná súťaž Železný hasič – o pohár KPO, ktorý v roku 2016 zaznamenal už úspešný 15. ročník, čím sa uvedená súťaž stala najstaršou súťažou tohto typu na Slovensku. Zriadením zboru a využitím jeho technických prostriedkov katedra čiastočne rieši otázku praktického výcviku záujemcov o činnosť v hasičských jednotkách.

Najväčšie úspechy zboru

8 x víťaz Územnej súťaže DHZ, Vzdelávanie a výcvik hasičských zborov zahraničných Slovákov v Rumunsku a Srbsku, výkon služby v DHZM Zvolen (Chromek, Mračková, Majlingová)

Základná hasičská technika

2x PS 12, 1 x PS 8, materiálne vybavenie pre DHZO kategórie „C“

Historické osobnosti hasičského zboru

Prof. Ing. Alexander Krakovský, CSc.: prvý predseda
Ing. Zuzana Tesáčková: študentka, spoluiniciátorka založenia zboru

Počet členov v roku 2017: 36

Establishment

February 26, 2003

Brief History and Activities

Voluntary Fire Brigade of the Technical University in Zvolen is organizationally included in the Detva – Zvolen territorial organization of the Voluntary Fire Protection of the Slovak Republic, but it also has its own statute of civil association, registered at the Ministry of Interior of the Slovak Republic.

It is the oldest university fire brigade in the modern history of Slovakia. The main aim of the fire brigade is the practical training of its members in means of the Voluntary Fire Brigade of the Technical University in Zvolen statutes and legislation in the field of fire protection. The intention is to build, organize and improve the voluntary fire-fighting. In the period 2013–2015, the Voluntary Fire Brigade of the Technical University in Zvolen was categorized as "C" Municipality Voluntary Fire Brigade. By changing legislation it was discarded from the Municipality Voluntary Fire Brigades categorization, but nevertheless the brigade remains involved in assisting the training of fire brigades in the Lest Training Centre of the Fire and Rescue Service. If necessary, when requested by the Regional Directorate of the Fire and Rescue Service, it is prepared to provide assistance to citizens in the Banská Bystrica region. For this activity it is presently funded from funds of the Voluntary Fire Protection of the Slovak Republic at a height of subsidies for "C" Municipality Voluntary Fire Brigade. The Brigade in its activities co-operates with the Department of Fire Protection, develops the modern tradition of fire-fighting at the University. It includes the social event "Admitting the students to the Fire-fighters Guild", Student Fire Balls and Rosambo, as well as sport competitions, e.g. in the TFA (Toughest Fire-fighter Alive) category, International Contest Iron Fireman – Challenge Cup of the Department of Fire Protection, which in 2016 had successful 15th year, and thus making that contest became the oldest contest of this type in Slovakia. By the establishment of the Brigade and use of its technical resources the Department partially solves the issue of the practical training of candidates for work in the Fire Brigades.

The great achievements of the Brigade

8 x winner of the Voluntary Fire Brigades Territorial Competition, education and training of fire brigades of Foreign Slovaks in Romania and Serbia, providing service in the Zvolen Municipality Voluntary Fire Brigade (Chromek, Mračková, Majlingová)

Basic Fire Equipment

2x PS 12, 1 x PS 8, material equipment for the "C" category Municipality Voluntary Fire Brigade

Historical personalities of the Fire Brigade
Professor Alexander Krakovský, PhD.: the first chairman
Zuzana Tesáčková: student, the co-initiator of the Fire Brigade establishment

Number of members in 2017: 36



Obr. 1 Zmiešané družstvo DHZ TU vo Zvolene pri požiarom útoku
Fig. 1 The mixed team of the Voluntary Fire Brigade of the Technical University in Zvolen in fire attack



Obr. 2 Víťazi územnej súťaže DPO v roku 2011
Fig. 2 The winners of the Voluntary Fire Protection territorial contest in 2011

VÝBOR DHZ / VOLUNTARY FIRE BRIGADE COMMITTEE



Predseda – veliteľ: Mgr. Ing. Ivan Chromek, PhD.
Chairman – Commander: Ivan Chromek, PhD.



Podpredseda – zástupca veliteľa: Marianna Palugová
Vice-Chairman – Deputy Commander: Marianna Palugová



Tajomník – pokladník: Erika Haľachová
Secretary – Teller: Erika Haľachová



Strojník: Róbert Hradiský
Machinists: Róbert Hradiský



Preventívár: Tomáš Novosedlák
Assistant for Fire Prevention: Tomáš Novosedlák



Referent pre prácu s mládežou: Ing. Pavel Husa
Assistant for Youth Work: Pavel Husa



Referent pre šport: Bc. Norbert Sekela
Assistant for Sport: Norbert Sekela



Revízor: Ing. Eva Mračková, PhD.
Reviser: Eva Mračková, Phd.

VELITELIA DRUŽSTIEV (PORADNÝ HLAS) / TEAM COMMANDERS (ADVISORY ROLE)



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ŠTUDIJNÉ PROGRAMY PROTIPOŽIARNA OCHRANA A BEZPEČNOSŤ NA TECHNICKEJ UNIVERZITE VO ZVOLENE

STUDY PROGRAMS FIRE PROTECTION AND SAFETY AT THE TECHNICAL UNIVERSITY IN ZVOLEN

Abstrakt:

V súčasnosti sú na Drevárskej fakulte Technickej univerzity vo Zvolene akreditované študijné programy Protipožiarna ochrana a bezpečnosť v odbore Záchranne služby v prvom, druhom a treťom stupni štúdia v dennej aj externej forme. Študenti sú zapísaní a študujú vo všetkých ročníkoch uvedených študijných programov.

Abstract:

At present there are accredited study programs Fire Protection and Safety in Rescue Services in the first, second and third degree of study in both full-time and part-time form at the Faculty of Wood Sciences and Technology of the Technical University in Zvolen. Students are enrolled and study in all years of mentioned study programs.

Úvod

Na základe výsledkov poslednej komplexnej akreditácie všetkých činností TU vo Zvolene, boli priznané práva uskutočňovať študijné programy Protipožiarna ochrana a bezpečnosť (ŠP POB) v dennej aj externej forme v I. a II. stupni štúdia v študijnom odbore Záchranne služby s garantkou prof. RNDr. Danicou Kačíkovou, PhD., ako aj ŠP Protipožiarna ochrana a bezpečnosť v dennej a externej forme v III. stupni, rovnako v študijnom odbore Záchranne služby s garantom prof. RNDr. Františkom Kačíkom, PhD. a spolugarantkami prof. RNDr. Danicou Kačíkovou, PhD. a doc. RNDr. Annou Danihelovou, PhD.

Charakteristika ŠP a profil absolventa študijných programov Protipožiarna ochrana a bezpečnosť v študijnom odbore Záchranne služby

Dĺžka štúdia v ŠP Protipožiarna ochrana a bezpečnosť v I. stupni štúdia je tri roky v dennej forme a štyri roky v externej forme. ŠP je uskutočňovaný v slovenskom jazyku a absolventom je udelený titul bakalár – Bc.

Predmety ŠP POB v I. stupni v plnom rozsahu napĺňajú opis študijného odboru. Pri získavaní teoretických poznatkov je dôraz kladený na ich praktické využívanie pri technologických postupoch záchranných prác a odstraňovaní následkov havárií a živelných pohrôm. Absolventi dokážu na základe vykonaných analýz navrhovať opatrenia na efektívne vykonávanie zásahov záchrannými zložkami integrovaného záchranného systému a na úseku ochrany pred požiarmi. V oblasti praktických schopností a zručností absolventi zvládnu prakticky riešiť konkrétne krízové situácie, organizovať, riadiť a usmerňovať sily a prostriedky pri likvidácii zložitých havárií a požiarov, pri živelných pohromách a iných mimoriadnych udalostiach. Dôležitým cieľom vzdelávania je aj pripraviť absolventov na schopnosť samostatného získavania poznatkov a udržiavať tak kontakt s posledným vývojom vo svojej disciplíne a pokračovať vo vlastnom profesionálnom rozvoji. Absolventi ŠP POB I. stupeň nájdu uplatnenie v zložkách integrova-

Introduction

Based on the results of the last comprehensive accreditation of all activities of the TU in Zvolen, there were granted the rights to carry out study programs Fire Protection and Safety (SP FPS) both in full-time and part-time form in the first and second degree in the study field Rescue Service with guarantor prof. Danica Kačíková, PhD., as well as study program Fire Protection and Safety in full-time and part-time form in the third degree, as well as in the study field of Rescue Services with guarantor prof. František Kačík, PhD., together with prof. Danica Kačíková, PhD. and assoc. prof. Anna Danihelová, PhD.

Characteristics of study program and profile of graduate of study programs Fire Protection and safety in the study field Rescue Services

The duration of study in the study program Fire Protection and Safety (SP FPS) in the first degree of study is three years in the full-time form and four years in the part-time form. The study program is provided in the Slovak language and the graduates are awarded the bachelor's title - Bc.

In the area of practical skills and abilities, the graduates can practically handle the crisis situations, organize, manage and coordinate the forces and means in coping with the complex accidents and fires, natural disasters and other emergencies. An important goal of education is to prepare the graduates to be able to acquire the knowledge independently and to keep in touch with the latest developments in their discipline and to continue their own professional development. The graduates of the first degree of the Fire Protection and Safety study program find application in the services of the Integrated Rescue System, especially in the Fire and Rescue System, at individual levels of state administration, public administration, organizations, legal entities and natural persons involved in the provision of rescue work and activities or performing activities in the field of fire protection.

ného záchranného systému, predovšetkým v Hasičskom a záchrannom zbore, na jednotlivých stupňoch štátnej správy, vo verejnej správe, v organizáciách, u právnických osôb a podnikajúcich fyzických osôb podieľajúcich sa na vykonávaní záchranných prác a činností alebo vykonávajúcich činnosť na úseku ochrany pred požiarmi.

Dĺžka štúdia v ŠP Protipožiarna ochrana a bezpečnosť v II. stupni štúdia je dva roky v dennej forme a tri roky v externej forme. ŠP je uskutočňovaný v slovenskom jazyku a absolventom je udelený titul inžinier – Ing.

Absolventi ŠP POB v II. stupni dokážu na základe vykonaných analýz navrhovať opatrenia na efektívne vykonávanie zásahov záchrannými zložkami integrovaného záchranného systému a na úseku ochrany pred požiarmi. V oblasti praktických schopností a zručností absolventi zvládnu prakticky riešiť konkrétne krízové situácie, organizovať, riadiť a usmerňovať sily a prostriedky pri likvidácii zložitých havárií a požiarov, pri živelných pohromách a iných mimoriadnych udalostiach. Sú schopní vykonávať výskum s vysokou mierou tvorivosti a samostatnosti v oblasti riadenia a vykonávania zásahov zložkami integrovaného záchranného systému, v oblasti zabezpečenia zásahov technikou a technických prostriedkami používanými pri záchranných prácach a v oblasti taktických zásad pri zásahoch a pri likvidácii požiarov. Majú znalosti o chemických procesoch horenia a hasenia, z oblasti riadenia a organizácie záchranných zložiek integrovaného záchranného systému ako aj z oblasti ochrany pred požiarmi. Konceptne a metodicky sú schopní vykonávať kontrolnú činnosť na úrovni ústredného orgánu štátnej správy.

Dĺžka štúdia v ŠP Protipožiarna ochrana a bezpečnosť v III. stupni štúdia je tri roky v dennej forme a päť rokov v externej forme. ŠP je uskutočňovaný v slovenskom jazyku a absolventom je udelený titul Philosophiae doctor – PhD.

Pri získavaní teoretických poznatkov je dôraz kladený na osvojenie si vedeckých metód výskumu, vývoja a riešenia krízových situácií pri požiaroch, haváriách a mimoriadnych udalostiach v špecifických podmienkach. Absolventi uvedeného stupňa štúdia získajú teoretické poznatky aj o metódach a technikách riadenia integrovaného záchranného systému s dôrazom na HaZZ a osvoja si etické a spoločenské stránky vedeckej práce a prezentovania vlastných výsledkov. Teoretické znalosti umožnia študentom v rámci vypracovanej dizertačnej práce rozvíjať v konkrétnych podmienkach teóriu horenia a hasenia v zložitých situáciách požiarov, teóriu riadenia záchranných zložiek, teóriu protipožiarna bezpečnosti stavieb a teóriu protipožiarna bezpečnosti technologických systémov a procesov so zdôvodnením efektívneho využitia vo vede aj s uplatniteľnými návrhmi do praxe. Povinné predmety v jednotlivých rokoch štúdia postupne zabezpečujú získanie znalostí z oblastí:

- vedeckých experimentov s dôrazom na prípravu plánovaného experimentu, uskutočnenie a vyhodnotenie experimentov v súlade s najnovšími trendmi v laboratórnej praxi a skúšobníctve;
- teórie vzniku požiarov a procesov horenia so zameraním na problematiku protipožiarna prevencie a efektívnej zásahovej činnosti pri zdolávaní požiarov a ich následkov v zástavbe, priemyselných podnikoch aj v prírodnom prostredí;
- jazykovej prípravy s dôrazom na komunikačné zručnosti pri riadení záchranných zložiek pri riešení havárií a mimoriadnych udalostí na medzinárodnej úrovni.

The duration of study in the second degree of the Fire Protection and Safety study program is two years in the full-time form and three years in the part-time form. Study program is provided in Slovak language and the graduates are awarded the title of engineer - Ing.

The graduates of the second degree of the Fire Protection and Safety study program are able to propose measures for the effective implementation of interventions by the rescue services of the Integrated Rescue System and in the field of fire protection, based on the analyses carried out. In the area of practical skills and abilities, the graduates can practically handle the crisis situations, organize, manage and co-ordinate the forces and means in coping with the complex accidents and fires, natural disasters and other emergencies. They are able to perform research with a high level of creativity and autonomy in the field of managing and implementing the interventions by the services of the Integrated Rescue System, in the field of supporting the interventions by the equipment and technical means used in rescue work and in the field of tactical principles in interventions and in the fighting the fires. They have knowledge of chemical processes of fire and extinguishing, of the management and organization of the rescue services of the Integrated Rescue System as well as of the field of fire protection. Conceptually and methodically, they are able to perform control activities at the level of the central state administration.

The duration of study in the second degree of the Fire Protection and Safety study program is three years in the full-time form and five years in the part-time form. Study program is provided in Slovak language and the graduates are awarded the title Philosophiae doctor - PhD.

In acquiring theoretical knowledge, the emphasis is on the acquisition of scientific methods of research, development and coping with crisis situations related to fire occurrence, accidents and emergencies in specific conditions. The graduates of this level of study acquire theoretical knowledge about the methods and techniques of managing the Integrated Rescue System with an emphasis on Fire and Rescue Service and the acquisition of ethical and social aspects of scientific work and presentation of own results.

The theoretical knowledge will enable the students to develop under specific conditions the theory of burning and extinguishing in complex fire situations, the theory of rescue services management, the theory of fire safety of buildings and the theory of fire safety of technological systems and processes, with justification of effective use in science and with applicable designs for practice. Compulsory subjects in the individual years of study gradually acquire knowledge from the following areas:

- Scientific experiments with emphasis on preparation of the planned experiment, implementation and evaluation of experiments in accordance with the latest trends in laboratory practice and testing;
- Theory of fire and burning processes focusing on the issue of fire prevention and effective fire-fighting activities and their consequences in constructions, industrial enterprises and in the natural environment;
- Language training with an emphasis on communication skills in the management of rescue services in dealing with accidents and emergencies at international level.

Povinne voliteľné predmety sú zamerané na oblasti:

- matematickej analýzy s dôrazom na schopnosť analyzovať špecifické problémy a pri výpočtoch a modelovaní efektívne uplatňovať matematické nástroje;
- operačnej analýzy so zameraním na rozhodovacie a optimalizačné úlohy pri systémovom chápaní javov a procesov;
- vedeckých experimentov s dôrazom na získanie správnych návykov pri prepojení teoretických poznatkov a vlastných experimentov s prienikom do prípravy podkladov na normotvornú činnosť;
- teórie pravdepodobnosti a matematickej štatistiky zameranej na správne interpretácie vedeckých postupov a získaných výsledkov;
- matematicko-počítačovej simulácie, odhadov presnosti a verifikácie počítačových modelov s dôrazom na aplikáciu, tvorbu a overovanie modelov a simulácií vybraných krízových situácií;
- bezpečnosti a protipožiarnej ochrany zameraných na získavanie relevantných informácií potrebných na riadenie činností, nasadenie síl a prostriedkov pri zásahoch ale aj v rámci prevencie;
- krízového manažmentu a manažmentu zmien s dôrazom na analýzu a hodnotenie krízových javov ako aj na tvorbu a optimalizáciu systémov v súlade s modernými modelmi zmien;
- rizikového manažmentu a teórie rizík so zameraním na použitie vedeckých metód na analýzu a modelovanie rizika a uplatnením teórie na minimalizáciu rizika v technológiách;
- riadenia záchranných činností a rozvoja ľudských zdrojov s uplatnením plánovacích metód aj v tvorbe organizačných štruktúr;
- teórie procesov horenia a ochrany konštrukcií pred účinkami požiaru s uplatnením právnych noriem na úseku ochrany pred požiarom.

Získané teoretické poznatky nájdu uplatnenie v súbežnej vedeckej činnosti zameranej na: riešenie metodologických a praktických otázok v oblasti procesov horenia a požiaru; protipožiarnej ochrany osôb, konštrukcií a technológií; identifikácie a kvantifikácie rizík; riadenie HaZZ a zložiek IZS; plánovanie záchranných zásahov s optimálnym nasadením síl a prostriedkov; tvorbu informačných systémov záchranných zložiek hlavne v súvislosti s ochranou pred požiarom.

Záver

Všetkým študentom, ktorí študujú v študijných programoch Protipožiarnej ochrany a bezpečnosť na Drevárskej fakulte Technickej univerzity vo Zvolene želáme úspechy pri zvládaní študijných povinností. Získajú nielen najnovšie teoretické vedomosti, ale hlavne praktické zručnosti a skúsenosti, ktoré uplatnia v praxi. Pre uchádzačov o štúdium je dôležitou informáciou, že práva uskutočňovať uvedené študijné programy sú pridelené bez obmedzenia, do nasledujúcej komplexnej akreditácie.

*prof. RNDR. Danica Kačíková, PhD.,
garantka ŠP POB I. stupeň, garantka ŠP POB II. stupeň,
spolugarantka ŠP POB III. stupeň*

Compulsory elective (optional) subjects are focused on:

- Mathematical analysis with an emphasis on the ability to analyse specific problems and to apply mathematical tools in calculations and modelling efficiently;
- Operational analysis focusing on decision-making and optimization tasks in systemic understanding of phenomena and processes;
- Scientific experiments with an emphasis on acquiring the right habits in the interconnection of theoretical knowledge and own experiments with the output into the preparation of documents for standardisation;
- The theory of probability and mathematical statistics aimed at the correct interpretation of scientific procedures and the results obtained;
- Mathematical-computer simulation, the accuracy and verification of computer models with emphasis on application, creation and verification of models and simulations of selected crisis situations;
- Safety and Fire Protection aimed at obtaining the relevant information needed to manage activities, deploy forces and resources in interventions as well as in prevention;
- Crisis management and change management with an emphasis on analysing and assessing crisis phenomena as well as creating and optimizing systems in accordance with modern models of change;
- Risk management and risk theory focusing on the use of scientific methods for risk analysis and risk modelling and the application of risk minimization theory in technology;
- Management of rescue activities and human sources development, with the use of planning methods also in the creation of organizational structures;
- The theory of burning processes and the protection of structures from the effects of fire, with the application of legal standards in the field of fire protection.

The obtained theoretical knowledge will be used in concurrent scientific activity focused on: solving methodological and practical tasks in the field of fire and burning processes; Fire protection of persons, structures and technologies; Identification and quantification of risks; Management of Fire and Rescue Service and Integrated Rescue System services; Planning rescue operations with optimal deployment of forces and resources; The creation of information systems for rescue services, especially in relation to fire protection.

Conclusion

All students who study in the Fire Protection and Safety study programs at the Faculty of Wood Sciences and Technology of the Technical University in Zvolen we wish success in managing their study duties. They acquire not only the latest theoretical knowledge, but also the practical skills and experience they will apply in practice. It is an important information for applicants to study that the rights to perform the above mentioned study programs are granted without limitation to the next comprehensive accreditation.

*prof. Danica Kačíková, PhD.,
Guarantor SP FPS 1st degree, Guarantor SP FPS 2nd degree, co-guarantor SP FPS 3rd degree*

VKONÁVANIE ODBORNEJ PRÍPRAVY NA KATEDRE PROTIPOŽIARNEJ OCHRANY IMPLEMENTATION OF A PROFESSIONAL TRAINING AT THE DEPARTMENT OF FIRE PROTECTION

Katedra protipožiarnej ochrany od roku 1995 vykonáva odbornú prípravu špecialistov požiarnej ochrany, technikov požiarnej ochrany a preventívárov požiarnej ochrany obce. Túto činnosť vykonáva na základe oprávnenia, udeleného Ministerstvom vnútra SR – Prezidiom HaZZ, na vykonávanie odbornej prípravy na úseku ochrany pred požiarimi. Prvým odborným garantom odbornej prípravy bol Ing. Ján Slosiarik, PhD., ktorý na Katedre protipožiarnej ochrany úspešne riadil a organizoval kurzy odbornej prípravy a ktorý patrí medzi zakladajúcich členov Katedry protipožiarnej ochrany na Dreavárskej fakulte. Od roku 1995 pokračovala v činnosti odborných príprav Ing. Eva Mračková, PhD., ako odborný a pedagogický garant, ktorá na Katedre protipožiarnej ochrany pôsobí ako vysokoškolský pedagóg vo funkcii odborného asistenta od roku 2003. Od roku 1995 10 rokov zastrešovala akreditáciu odborných príprav za Technickú univerzitu vo Zvolene. V roku 2008 sa odborná príprava rozšírila o kurzy základnej prípravy členov hasičských jednotiek, na základe získaného oprávnenia od MV SR. Lektori doteraz vyškolili 2000 členov DHZ mesta/obce v SR. Vykonali školenia aj v Srbsku a Rumunsku pre Slovákov žijúcich v týchto štátoch. Posledná akreditácia v roku 2017 priniesla zmeny, ktoré súvisia so zmenou podmienok na udelenie oprávnenia pre vykonávanie odbornej prípravy na úseku ochrany pred požiarimi, v zmysle novely zákona o ochrane pred požiarimi č. 129/2015 Z. z.. Nová akreditácia bola pre Katedru protipožiarnej ochrany úspešná pre všetky odborné prípravy a budú sa na nej podieľať členovia katedry ako i odborníci z praxe, s odbornou spôsobilosťou na úseku ochrany pred požiarimi alebo pedagogickým vzdelaním pre jednotlivé oblasti odbornej prípravy a odbornou praxou v danej oblasti najmenej tri roky. Menovite ide o nasledovných lektorov: prof. RNDr. Danica Kačíková, PhD., Ing. Katarína Dúbravská, PhD., Ing. Mgr. Ivan Chromek, PhD., Ing. Iveta Mitterová, PhD., Ing. Eva Mračková, PhD., Ing. Ľudmila Tereňová, PhD., Ing. Martin Zachar, PhD. Okrem uvedených lektorov, ktorí sú členmi Katedry protipožiarnej ochrany, sú členmi lektorského kolektívu Ing. Dušan Hancko, riaditeľ OR HAZZ vo Zvolene, Ing. Rastislav Skrovný, PhD., špecialista požiarnej ochrany, Ing. Božena Sliacka, PhD. a Mgr. Ivana Chromeková.

Lektorskému kolektívu prajeme veľa úspechov pri vykonávaní ďalších odborných príprav a prajeme si, aby sa k nám na kurzy odbornej prípravy naďalej vracali naši absolventi, ktorí úspešne pôsobia v danej oblasti v praxi, ako i ďalší odborníci z oblasti ochrany pred požiarimi.

*Ing. Ľudmila Tereňová, PhD.
odborný garant odborných príprav
Ing. Eva Mračková, PhD.
organizačný garant odborných príprav*

Since 1995, the Department of Fire Protection has been training the specialists in fire protection, fire protection technicians and municipal fire prevention persons. This activity is carried out on the basis of the authorization, granted by the Ministry of the Interior of the Slovak Republic - the Presidium of Fire and Rescue Service, for the implementation of professional training in the field of fire protection. The first professional guarantor of professional training was Ján Slosiarik, PhD., Who successfully managed and organized the training courses at the Department of Fire Protection and who is one of the founding members of the Department of Fire Protection at the Faculty of Wood Sciences and Technology. Since 1995, Eva Mračková, PhD. continued in the professional training activities as a professional and pedagogical guarantor. She works a university lecturer in the position of a professor assistant since 2003. Since 1995, for 10 years, she has covered the accreditation of Professional trainings on behalf of the Technical University in Zvolen. In 2008, the professional training was extended to courses of basic training for members of fire brigades, based on obtained authorization from the Ministry of the Interior of the Slovak Republic. Lecturers so far trained 2,000 members of municipality voluntary fire brigades in Slovakia. They also provided trainings in Serbia and Romania for Slovaks living in those countries. The last accreditation in 2017 brought changes related to the change of the conditions for granting the authorization for implementation of professional training in the field of fire protection in the terms of amendment of the Act on Fire Protection no. 129/2015 Coll. The new accreditation was successful for the Department of Fire Protection for all professional training courses, and all the members of the Department as well as practitioners with professional competence in the field of fire protection or pedagogical education for individual training areas and professional experience in the field for at least three years, will be involved in their implementation. Namely the following lecturers: prof. Danica Kačíková, PhD., Katarína Dúbravská, PhD., Ivan Chromek, PhD., Iveta Mitterová, PhD., Eva Mračková, PhD., Ľudmila Tereňová, PhD., Martin Zachar, PhD.

Besides the mentioned lecturers who are members of the Department of Fire Protection, there are members of the lecturer's team also Dušan Hancko, Director of the District Directorate of Fire and Rescue Service in Zvolen, Rastislav Skrovný, PhD., the fire protection specialist Božena Sliacka, PhD. and Ivana Chromeková. We wish the lecturer's team a great deal of success in implementing the further professional trainings, and we wish that our former graduates, who successfully work in this field in the practice, as well as the other experts in the field of fire safety, will continue to return to our training courses.

*Ľudmila Tereňová, PhD.
Expert guarantor of training
Eva Mračková, PhD.
Organisational guarantor of the training*



PROTIPOŽIARNA OCHRANA A BEZPEČNOSŤ 2017 FIRE PROTECTION, SAFETY AND SECURITY 2017



Katedra protipožiarinej ochrany Drevárskej fakulty Technickej univerzity vo Zvolene pri príležitosti 20. výročia svojho založenia zorganizovala v dňoch 3. – 5. mája 2017 medzinárodnú vedeckú konferenciu s názvom „Fire Protection, Safety and Security 2017“. Miestom konania konferencie je Kongresové centrum Technickej univerzity vo Zvolene.

Konferencia sa koná pod záštitou prof. Ing. Rudolfa Kropila, CSc., rektora Technickej univerzity vo Zvolene a gen. JUDr. Alexandra Nejedlého, PhD., prezidenta Hasičského a záchranného zboru. Odbornými garantmi konferencie sú prof. RNDr. Danica Kačíková, PhD. a prof. RNDr. František Kačík, PhD. Organizačný výbor konferencie tvoria všetci pracovníci Katedry protipožiarinej ochrany.

Počas konferencie budú prezentované aktuálne poznatky a výsledky výskumu pracovníkov katedry, jej úspešných absolventov bývalých i súčasných študijných programov ako aj pracovníkov spolupracujúcich inštitúcií a hostí.

Medzi hlavné vedecké oblasti konferencie patria:

- Protipožiarna ochrana a bezpečnosť.
- Hasičská technika a požiarna taktika.
- Krízový manažment a riešenie krízových situácií.

Súčasťou konferenčného programu je aj realizácia workshopu zameraného na predstavenie nových prístupov k zisťovaniu príčin vzniku požiarov a havárií v podmienkach Slovenskej republiky a seminára s názvom „Progressívne metódy zisťovania požiaro-technických charakteristík materiálov v požiarnom inžinierstve“. Odborným garantom workshopu je Ing. Martin Zachar, PhD. Odbornými garantmi spomínaného seminára sú prof. RNDr. Danica Kačíková, PhD. a prof. Ing. Karol Balog, PhD.

Výstupom z konferencie je konferenčný zborník, obsahujúci celkovo 46 vedeckých príspevkov, publikovaných výhradne v anglickom jazyku a akceptovaných dvomi nezávislými recenzentmi. Tento bude zaslaný na posudzovanie na účely jeho registrácie do viacerých citačných databáz, z ktorých by sme chceli vyzdvihnúť najmä citačnú databázu Web of Science.

Okrem odborného programu konferencie bude v spolupráci s našimi dlhodobými partnermi a spolupracovníkmi zorganizovaných aj niekoľko sprievodných podujatí, spomedzi ktorých možno spomenúť najmä prezentáciu partnerov a reklamných partnerov konferencie, ukážky kynologickej služby, cvičenia vybraných záchranných zložiek a prijímanie študentov TU vo Zvolene do Cechu hasičského.

Na konferencii sa zúčastňujú odborníci v oblasti protipožiarinej ochrany a bezpečnosti z celkovo 5 európskych a 3 mimoeurópskych krajín.

The Department of Fire Protection of the Faculty of Wood Sciences and Technology at the Technical University in Zvolen organized, on the occasion of its 20th anniversary, the international scientific conference titled „Fire Protection, Safety and Security 2017“ on May 3rd – 5th, 2017. The Conference is placed in the area of the Congress Centre of the Technical University in Zvolen.

The conference is held under the patronage of professor Rudolf Kropil, PhD., the Rector of the Technical University in Zvolen and general Alexander Nejedlý, PhD., the President of Fire and Rescue Service. The Scientific Guarantors of the conference are professors Danica Kačíková, PhD. and František Kačík, PhD. The Organisational Committee is composed of all the employees of the Department of Fire Protection.

During the Conference, there are going to be presented advanced knowledge and research results of department staff and successful graduates of former and current study programs as well as the staff of co-operating institutions and guests.

Among the main scientific topics of the conference belong:

- Fire Protection and Safety.
- Fire-Fighting Equipment and Fire Tactics.
- Crisis Management and Crisis Situations Coping.

A part of the conference program is the realisation of the workshop aimed to introduce new approaches to fire and accidents investigation in the Slovak Republic and the seminar entitled „Progressive methods of material fire-technical characteristics determination in fire engineering“. Scientific guarantor of the workshop is Martin Zachar, PhD. The scientific guarantors of the above seminar are professor Danica Kačíková, PhD. and professor Karol Balog, PhD.

One of the Conference outputs is the Conference Proceedings, composed of 46 scientific papers, published exclusively in English and accepted by two independent reviewers. This will be sent to be evaluated and further included in the citation databases, of which we would like to emphasize the Web of Science citation database.

In addition to conference program, there are prepared several accompanying events, in particular the presentation of partners and advertising partners of the conference, demonstrations of Cynological service, co-operational exercise of selected emergency services and admission of students of the Technical University in Zvolen to the Fire-Fighters Guild.

In addition to the Conference program, in co-operation with our long-term partners and collaborators, there are organised several accompanying events, in particular the presentation of partners and advertising partners of the Conference, demonstrations of the Cynology service, exercise of selected emergency services and Admission of students of the Technical University in Zvolen to the Fire-Fighters Guild.

At the Conference, there participate the Fire Protection, Safety and Security experts coming from 5 EU and 3 non-EU countries.

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	Číslo 21 / 2017	5 EUR
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Dátum:

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1. Pôvodný doteraz neuverejnený príspevok nemá prekročiť 6 strán (formát A4, písmo Times Roman 12 bodov). Rukopis v jazyku slovenskom musí obsahovať resumé v rozsahu 1 strany v jazyku anglickom a obrátene.

The unpublished submission should not exceed 6 pages (format A4, Times Roman, size 12). Manuscript written in Slovak language must include 1 page Resume in English language and English manuscript must include 1 page Resume in Slovak language.

2. Príspevok pošlite e-mailom na adresu redakcie ako prílohu spracovanú v aplikácii Microsoft WORD. Grafy, tabuľky, obrázky, schémy, ktoré nie sú spracované v Microsoft Word, priložte v digitálnej forme (gif, jpg, tiff alebo BMP súbory) samostatne.

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References in text should be marked by first information and year in brackets. The list of references should follow the paper according to ISO 690.

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The author's full name, institution address and e-mail must be enclosed.

5. Príspevok posúdi redakčná rada a pošle recenzentom. Pred tlačou bude poslaný autorovi na korektúru. Poplatok za uverejnenie článku – 30 €.

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6. Termíny na zaradenie príspevkov: 31. október pre prvé číslo v nasledujúcom roku, 31. máj pre druhé číslo v aktuálnom roku.

The deadlines for submissions are: 31 October for first issue in the next year, 31 May for the second issue in the actual year.