

2.14 Fire research in Poland (short version)

Krol P., Poland

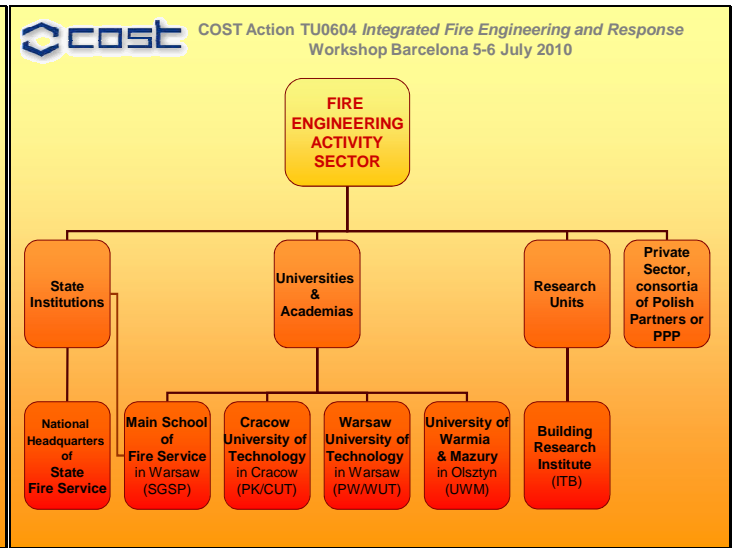
 COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



Fire research in Poland

Pawel A. Krol
Warsaw University of Technology

1



2

 COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



National Headquarters of State Fire Service
www.straz.gov.pl

Evolution of fire prevention related regulations – directions (for details ask K. Biskup – WG3) :

- more attention to requirements concerning preparation of buildings/structures for fire-fighting and rescue activities,
- more flexibility in using alternative solutions – more room for fire safety engineering (step toward performance-based design),
- filling gaps and adjustment to changes in other regulations,
- (new) general rule: new fire protection requirements are applicable for newly constructed buildings, for existing ones conformity must take place during closest modernization,
- more precise specification of requirements in the range of acceptance of construction designs (including improvement of this process supervision).

3

 COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



National Headquarters of State Fire Service
www.straz.gov.pl

Examples of Projects (1) (for details ask K. Biskup – WG3)

- **BeSeCu** (Human behaviour in crisis situation: A cross cultural investigation in order to tailor security-related communication), international consortium, 7 FP
- **Elaboration and implementation of simulator for training on commanding during rescue activities connected to fires in multi-storey buildings and traffic accidents**, consortium of Polish partners, Ministry of Science and Higher Education
- **Research on elaborating of dual purpose mist extinguishing system protecting against flashover phenomena in historical buildings**, consortium of Polish partners
- **Integrated mobile system supporting counter terrorist and counter crisis activities – PROTEUS**, consortium of Polish partners, EU structural funds – Operational Program Innovative Economy

4

 COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



National Headquarters of State Fire Service
www.straz.gov.pl

Examples of Projects (2) (for details ask K. Biskup – WG3)

- **The Cell Broadcast for Public Warning** – sharing knowledge and experiences and identification and standardisation of technical requirements, international consortium
- **Determining of border conditions for using helicopters in rescue operations in high-rise buildings**, consortium of Polish partners, Ministry of Science and Higher Education
- **Acoustic warning devices in sport structures – warning in crisis situations**, consortium of Polish partners, Ministry of Science and Higher Education
- **Researches on creating ecological, biodegradable wetting agents, improving efficiency of firefighting**, CNBOP (Science and Research Centre for Fire Protection), Ministry of Science and Higher Education

5

 COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



The Main School of Fire Service in Warsaw (SGSP)
www.sgsp.edu.pl


SGSP is the only one in Poland and one of the few state technical universities in the world, which trains fire service officers and educates specialist in fire safety and civil safety engineering at the same time. SGSP reports to the Minister of Internal Affairs and Administration. It has full academic rights and constitutes an organisational unit of the State Fire Service (PSP).

SGSP offers two types of classes: day and extramural, both of the same academic character. Graduates can obtain either bachelor's or master's degree. There is also a wide variety of postgraduate and specialised courses available.



6

cost COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



The Main School of Fire Service in Warsaw (SGSP)
www.sgsp.edu.pl


Main Fields of Research

Laboratory equipment:

- Stand for determination of steel's strength parameters in variable temperature fields
- Chamber furnace for samples, heating up to 1100°C, with possibility to program the temperature variation in time
- Stand for testing thermal expansion of steel samples in fire temperature
- Stand for testing bond between steel bars and concrete


Current research:

- Heating rate impact on parameters of steel under fire conditions (*R. Kamocka – for details see poster*)
- Several national and European grants and projects (*for details see poster*)



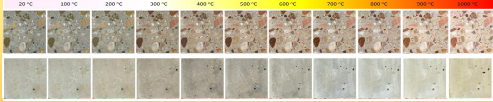
7

cost COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



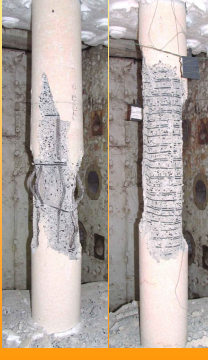
Cracow University of Technology (CUT/PK)
www.pk.edu.pl

Main Fields of Research



Current research:


- The application of RGB histogram analysis of colour images as a method of assessing the condition of concrete in structures after fire (*J. Hager – for details see poster*)
- Influence of tie spacing on fire resistance of HSC columns (*Sz. Seraga – for details see poster*)
- Safety evaluation for accidental fire situation – selected aspects of reliability of structures in fire conditions (*M. Mastak – WG1*)



8

cost COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010

Warsaw University of Technology (WUT/PW) www.il.pw.edu.pl
Faculty of Civil Engineering www.il.pw.edu.pl




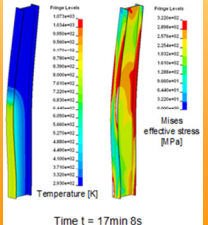
Main Fields of Research

Lab tests performed in the past:

- The influence of rapid cooling on compressive strength of concrete heated up to high temperature
- Thermal inertia of concrete heated up to high temperature
- RC beams (specimens) subjected simultaneously to mechanical load and high temperature

Current research & Plans for future:


- Testing of reinforcing bars subjected to tension and high temperature (*R. Kowalski – WG3*)
- Testing of RC beams (specimens); estimation cross-section stiffness decrease (*R. Kowalski – WG3*)
- Virtual testing of structures and computer modeling as an alternative for traditional testing (*L. Kwasniewski, P. Krol – WG2*)

9

cost COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010

University of Warmia and Mazury in Olsztyn (UWM)
www.uwm.edu.pl




Main Fields of Research

- The main research in the field of Fire Engineering is concentrated in the Faculty of Technical Sciences

Current research & Plans for future:

- Evaluation of the capacity of structures after fire (*Z. Drabowicz – WG1*)
- Approximate models for analysis of steel structures under fire loading (*Z. Drabowicz – WG1*)



10

cost COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



Building Research Institute
DEPARTMENT OF FIRE RESEARCH (NP)



- The Fire Research Department of the Building Research Institute has 40 years of experience in the field of research
- The Fire Research Department consists of:
 - The Division of Fire Resistance and Smoke Control
 - The Division of Fire Development and Material Testing
 - A branch office in Katowice
- With the Fire Research Department works jointly the Fire Testing Laboratory. The Fire Testing Laboratory has received the EGOLF (The European Group of Official Laboratories for Fire Testing) certificate.

11

cost COST Action TU0604 *Integrated Fire Engineering and Response*
Workshop Barcelona 5-6 July 2010



Building Research Institute
DEPARTMENT OF FIRE RESEARCH (NP)

Areas of Research

- The Fire Research Department conducts research in fire safety including:
 - Principles of building project, element and installation designs
 - Research, assessment and rules of application of building products

Research is carried out for the needs of:

- The development of fire safety engineering
- Legislation and standardization
- The building industry (i.e. investors, architects, contractors and manufacturers)



12