

# An extract from the Fire Safety Manual prepared in 2013 for Szczecin Maritime University's PASAT hall of residence located at 9 Starzynski Street, Szczecin.

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## The purpose of this document

The Fire Safety Instructions (FSI) have been drawn up to define fire protection requirements and to familiarize personnel with issues of fire safety, including prevention, and with tasks that have to be carried out if a fire or other local hazard occurs.

## Description of the building

The building is located in a campus comprising several buildings: two halls of residence Pasat and Korab, educational facility, indoor swimming pool, multi-functional buildings with lecture theatres and a canteen. PASAT, mainly provides accommodations for students and staff of the Maritime University of Szczecin, additionally including campus administration offices.

The building consists of **11** floors and a full-scale basement. The building height of about **32 m** is in the 25-55 m range, so it belongs to the class of tall buildings.

## Conditions of fire protection

Pursuant to Paragraph 209.2 of the Regulation of the Minister of Infrastructure of 12 April 2002 on the technical conditions of buildings and their location (Journal of Laws No 75 item 690 with amendments) the SDM PASAT facility due to the purpose and actual use is classified as having **ZL III and ZL V** levels of people-related fire hazards. The building may accommodate up to 525 people.

The building is equipped with:

- **internal hydrants** - installation of internal 52 mm hydrants in cabinets including flat-stored fire hoses, located at passageways near the stairways.
- **fire alarm system (FAS)** - the system is protected by the FAS installation. The protection covers all floors of the building, and the monitoring panel is situated in the concierge room, next to the entrance to the building. **The fire monitoring operator shall send a signal to the fire brigade.**
- **sound warning system (SWS)** - covers the whole building and messages are released automatically. **The fireman's microphone is installed at the concierge room by the entrance.**
- **emergency evacuation lighting** - installed in all passageways, the lights have independent power supply.

## Potential sources of fire

Potential risks of fire exist due to:

- a) carelessness, recklessness or negligence, in particular caused by:
  - smoking cigarettes and using naked fire in prohibited areas,
  - tossing cigarette ends or burning matches into litter baskets containing flammable materials,
  - leaving switched on electric devices unwatched,
  - use of flammable liquids while smoking or using a naked flame,
  - carrying out fire risk activities, such as hot work while appropriate fire safety measures are not taken.
- b) electric equipment and installation faults, caused by:
  - use of makeshift electric appliances (getting hot, sending sparks),
  - operation of substandard power installations and devices, mounted or repaired by non-specialists,
  - bad condition of power switchboards, switches, breakers and other devices,
  - failure to maintain power installations,
  - power network overload,
  - makeshift repairs of fuses,
  - arson, lightning - due to improper maintenance or damage to the lightning protection and earthing installation.
  - non-compliance with the applicable fire regulations,
  - incorrect use of heating devices.

## Routes of fire spreading.

Fire can propagate in the buildings via:

- technical connections between the rooms within the buildings,
- combustible interior decoration components and equipment,
- doors and windows made of combustible materials.

A fire will spread outside a burning room through various gaps, including those in doors and windows.

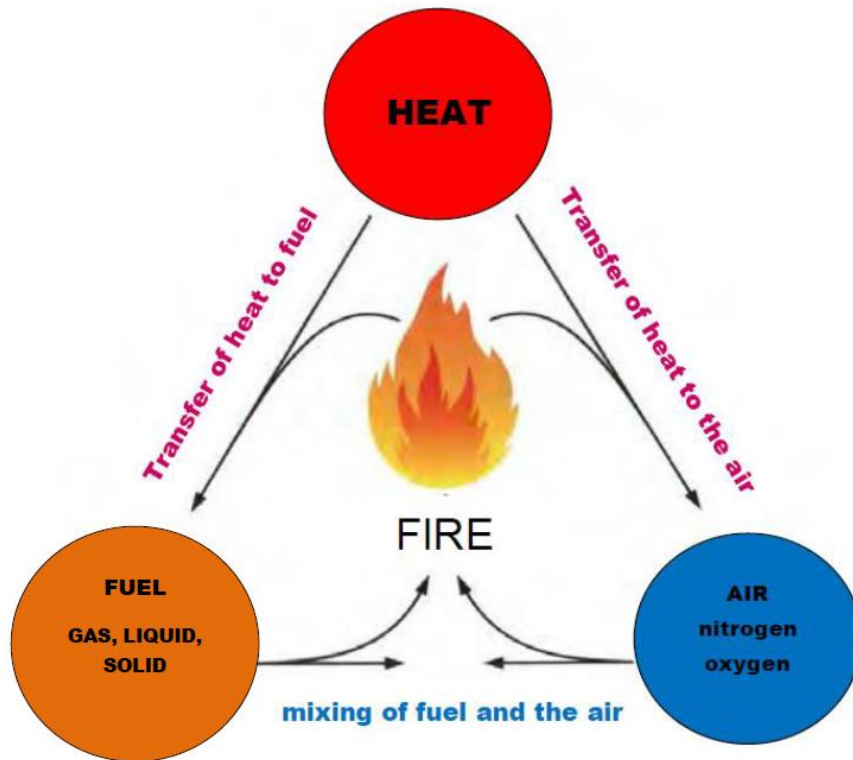
## **Activities prohibited at the premises and in the buildings.**

The following actions are not allowed around and in the buildings of the Maritime University of Szczecin:

- heating pitch or other materials with open flame device at a distance less than 5 metres from the building, adjacent storage area or yard with stored combustible materials; it is allowed to perform such work on the roof of non-combustible structure, by using appropriate heaters,
- burning garbage and other wastes at a site where a risk of ignition exists in proximity of buildings of combustible materials,
- the storage of flammable and explosive liquids in the rooms technically not adjusted for the purpose.
- tossing cigarette ends, matches, etc. tapping ash on the floor or to litter baskets,
- emptying ashtrays into litter baskets without making sure that all cigarette ends are put out,
- putting combustible materials into ashtrays, as it creates a risk of ignition from glowing ash or a match,
- keeping combustible materials on radiators or other heating devices,
- gathering combustible materials produced at work - they should be removed immediately after work,
- blocking access to fire-fighting equipment, electric switches and power distribution boards with any materials or objects,
- use of fire equipment for purposes not related to fire protection,
- keeping valuable files, cash, and data carriers etc. in non-fireproof cabinets,
- using damaged electric-powered equipment and installations and repairs by non-authorized and unqualified personnel,
- leaving electric equipment plugged after work (ventilators, cookers, heaters),
- operation of electric heating equipment at a distance less than 0.5 m from combustible materials and without thermal insulation protecting the floor/base from ignition,
- use of electric heaters with open, unshielded heating elements,
- leaving rooms without making sure that there is no risk of fire; the check should include electric-powered devices, gas cooker, cigarette ends should be poured with water, windows should be closed,
- smoking and using open flames in rooms where prohibited by fire safety signs,
- locking emergency exits in a manner excluding their immediate use,
- doing other activities that reduce fire safety, or could contribute to fire setting or spreading,
- blocking or restricting access to: internal hydrants, emergency exits, fire-protection electric switches, electric distribution boards etc.

## **Portable fire-fighting equipment - general information, how to use.**

For fire preventing and fire-fighting activities to be effective, personnel should have basic knowledge of the combustion process, allowing a comprehensive assessment of the elements related to the widely understood phenomenon of fire. In general, burning is a chemical process, during which a combustible material connects with an oxidizing agent (usually oxygen), producing light, heat and other combustion products. To initiate and sustain the process of combustion, there must be a right proportion of combustible material, oxidizing agent and source of ignition. It clearly follows that to stop the existing process of combustion (burning) the proportions have to be changed by:



- removing combustible material or making it non-combustible in the local conditions,
- eliminating the heat that maintains combustion (cooling of the combustion system),
- cutting off the oxidizing agent from the place of fire.

The above actions are essential for fire extinguishing methods, in which portable fire-fighting equipment will be effectively used only if there is a chance of putting out the fire in its initial phase. Portable fire-fighting equipment is intended for use by one person, aimed at cooling the combustible material, or cutting off oxygen, or the two factors occur at the same time.

**Cooling**



**Removal of flammable material**

**cutting off oxygen**

**anti-catalyst action**

Portable fire-fighting equipment includes:

- fire extinguishers and monitors,
- pressurized water extinguishers,
- fire blankets,
- internal hydrant.

The building is equipped with portable fire extinguishers that meet relevant Polish standards. The extinguishers deployed in the buildings are suitable for extinguishing various types of fire that may occur due to existing hazards.

**Fire extinguishers** – portable devices with gross weight up to 20 kg and a mass of the fire-fighting agent up to 12 kg, used by manual release of pressurized gas. The basic division of fire extinguishers is based on the type of agent used: powder, foam and CO<sub>2</sub>.

**Powder extinguisher** - a cylinder fitted with a secured handle that, when squeezed, activates the valve or piercer opening a high-pressure gas canister. The extinguishing agent (powder) is discharged under pressure through a nozzle or hose with a nozzle by inert gas, nitrogen or CO<sub>2</sub>.

## POWDER EXTINGUISHER

In case of fire:

- Take off the extinguisher and approach the fire
- Pull out the pin and press the lever to release the powder
- Direct the powder stream at the base of the fire by pressing the nozzle

The pressure gauge shows the constant pressure maintained in the extinguisher.



**Foam extinguisher** - a cylinder fitted with a secured handle that, when squeezed, activates the valve or piercer opening a high-pressure gas. The foam-producing agent is discharged through a nozzle or a hose with a nozzle in which the chemical is aerated and foamed. The agent is expelled by high-pressure inert gas, nitrogen or CO<sub>2</sub>, or foam production through a chemical reaction. Due to its siphon type construction, the extinguisher works properly only in the vertical position.

**CO<sub>2</sub> extinguisher** is a cylindrical vessel fitted with a valve and a hose with an outlet nozzle, while small extinguishers have a rotary connector with a nozzle. The extinguisher contains liquefied CO<sub>2</sub>, which after activation under own pressure is discharged, cooling itself down to about -80°C. Regardless of its type and weight, the extinguisher is handled as follows:

- take the extinguisher to the scene of a fire,
- break the seal and take off the safety pin,
- squeeze or press the lever, piercer or valve, respectively, and aim the stream of extinguishing agent at the point of fire origin.

The extinguishing action can be stopped any moment by releasing the activating lever or the nozzle lever.

## CO<sub>2</sub> EXTINGUISHER

In case of fire:

- Take off the extinguisher and approach the fire
- Pull out the pin and press the lever to release CO<sub>2</sub>
- Direct the nozzle at the base of the fire.

This extinguisher can be used for fighting a fire of live electric devices. When used, the extinguisher gets cold. Hold the handle of the nozzle only.



A fire blanket, generally 2 m x 2 m in size, is a sheet made of non-combustible fabrics. The fire blanket is stored in a special package. It serves to suppress slow fire by cutting the air off the burning object.

How to use: take the blanket out of the package, unfold and cover the flaming item tightly. If a person is alight, s/he should be put lying on the floor and tightly covered with a fire blanket. Fire blankets can also be used evacuate property.

## FIRE BLANKET

### In case of fire:

- Hold the tabs and pull the blanket down, breaking the seal
- Quickly approach the fire from windward
- Unfold the blanket by shaking it down
- Put it over the burning object
- Press the edges of the blanket around the burning object to cut off oxygen
- Leave the blanket until the fire is put out

**Be careful, there is a risk of suffering burns caused by hot flames getting out of the blanket.**



An internal hydrant is a valve, installed in a special water network; the hydrant is placed in a cabinet and fitted with a fire hose and nozzle. Its diameter may be 25 mm or 52 mm, and the hose is 20 m long. The internal hydrant is used for suppressing small fires where water is the proper extinguishing medium.

The hydrant is handled as follows:

- open the cabinet door, check that the hose and nozzle are connected,
- run out the whole hose, avoid folding and twisting,
- aim the water jet at the fire.

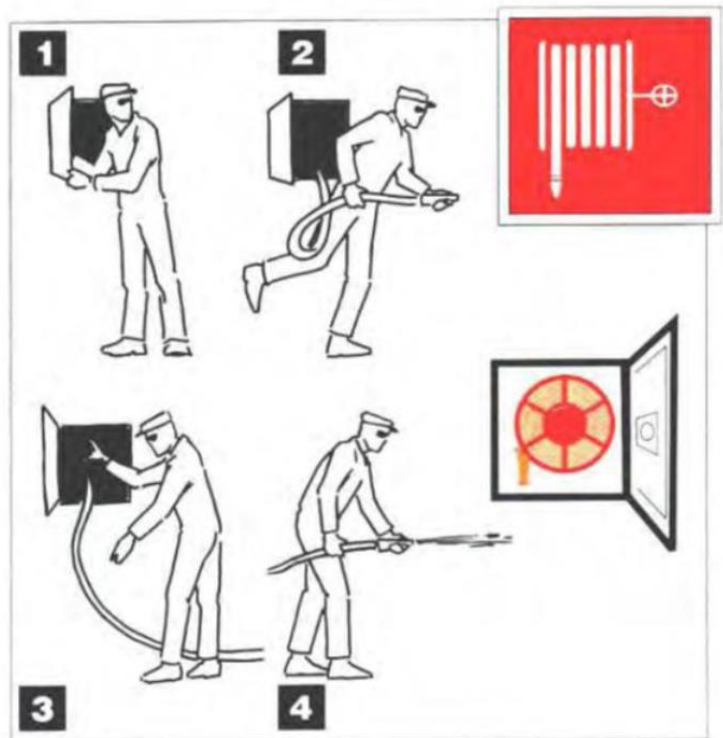
## HYDRANT

### In case of fire:

- Open the cabinet door, breaking the seal
- Hold the nozzle and quickly approach the fire, running out the hose
- Remove the twists and folds in the hose,
- Open the valve by turning the round tap anti-clockwise,
- Direct the water jet into the base of the fire.

If necessary, connect an extra hose section between the valve and the first section to lengthen it. To do that, first close the water supply.






The hydrant cannot be used for putting out electric fires due to high risk of electrocution.



The following principles should be observed when a fire is being extinguished:

- direct the extinguishing medium jet onto the flame front and move towards the centre,
- if vertical objects are on fire, start by directing the extinguishing jet from top downwards,
- use only fire fighting medium intended for a given fire class:
  - class A - fires where glowing combustion takes place, includes wood, paper, textiles; powder extinguishers filled with phosphate powder;
  - class B - flammable liquids and solid melting substances; powder or CO<sub>2</sub> extinguishers are used.
  - class C - flammable gases, e.g. propane, acetylene, natural gas; powder or CO<sub>2</sub> extinguishers are used.
  - class D - light metals - magnesium, sodium, potassium; powder extinguishers with a special powder suitable for this class of fire.
  - class F - fire of boiling liquids, mainly fats in kitchen appliances; foam extinguishers with a special medium.



CLASS	Type of material on fire	Type of the extinguishing agent
	Solids of organic origin that, when burning, glow (wood, paper etc.)	Water, extinguishing foam, extinguishing powder, carbon dioxide (CO <sub>2</sub> )
	Flammable liquids and solids melting due to heat (solvents, floor polish, melting plastics)	extinguishing foam, extinguishing powder, carbon dioxide (CO <sub>2</sub> ), halon replacements
	Flammable gases (town gas, methane, propane)	extinguishing powder, carbon dioxide (CO <sub>2</sub> ), halon replacements
	Light metals	extinguishing powders
	Cooking oils and fats	extinguishing foam

- approach the fire from windward (wind blowing in your back),
- operate the extinguisher as per the instruction and direct the fire medium jet onto the source of fire in the direction of the wind. The firefighter should not get exposed to smoke and heat radiation,
- putting out surface fires should start from the fire front, with the sweeping movement from side to side. It is unreasonable to direct the extinguishing jet into the middle of a fire, because it causes its expansion,
- fires of falling drops and liquids should be suppressed from top to bottom, Burning liquids falling on the floor cause another fire; until drops of falling liquid are not put out, we will not be able to put out a fire on the floor,
- and wall fires should be extinguished from bottom to top. The heat rising vertically up results in the propagation of burning material. The fire developing upwards may be limited after the fire source is put out first,
- make sure you use several extinguishers effectively, i.e. simultaneously, not one after another; take time to gather the required number of fire-fighting devices near the fire; it is important when we know that one extinguisher is not sufficient,
- watch out for re-ignition, flammable fumes may reignite when in contact with hot objects.








## Evacuation and fire safety signs






While establishing the type and location of fire safety and evacuations signs, one should take into account the size, nature of fire hazards, building construction and space-related solutions.

Example signs and their distribution is shown in the tables below:

<b>PN-92/N-01256-02 Safety signs - evacuation</b>			
#	evacuation sign	sign designation	use
1		emergency exit	the sign marks exits leading from the building, another facility or area – outside; exits leading to another fire zone, including an enclosed, door-separated stairways – in a building more than 25 m high; the sign should be placed directly above the door.
2		direction of escape route	the arrow shows which way to the exit to be used in an emergency. long arrow – standalone sign, short arrows – to be used with other signs.
3		emergency exit door	The sign should be used with the sign 'direction of escape route' – short arrows; it marks a door in the way of an established escape route, not mentioned in p. 1, also the exit door from a small hall.
4		pull / push to open	the signs used together with those in p. 3 above, on the door of an emergency exit, if such signs are allowed; the arrow should point at the direction the door opens; usually used on doors that open in a manner other than prescribed by the regulations (from the room outside).
5		direction to the exit of escape route	these signs are placed where the direction of evacuation may seem doubtful: signs 'emergency exit' or 'emergency exit door' are not visible, or when more such signs are visible, and people should follow only one of those signs, according to the evacuation plan; placed on walls, about 150 cm high, or over an escape route at 200 cm above the floor, where possible – across the direction of evacuating people.
6		direction to the exit of escape route upstairs / downstairs	
7		break to get access	use this sign only if reasonably required: in a place where a glass has to be broken to get access to a key or unlocking system, or when a glass obstacle has to be broken to get through towards an exit.

**PN-92/N-01256-02 Safety signs – fire protection**

#	evacuation sign	sign designation	use
1		Inside hydrant	This sign is placed on the hydrant cabinet door.
2		Extinguisher	The sign marks locations of portable firefighting appliances.
3		Fire extinguishing set	This sign replaces a number of specific signs to mark multiple firefighting appliances.
4		Manual activation	It indicates a fire alarm button or manual control of fire equipment, e.g. stationary extinguishers.
5		Emergency telephone	The sign indicates the location of a phone to be used to warn and alarm others in case of fire.
6		Acoustic alarm	It may be used separately or with sign 4, if the fire button activates a sound signal alerting directly personnel present in the danger area.
7		No smoking	It is used where smoking may pose a risk of fire.
8		Do not use open flame / No smoking	It is used where smoking or naked flame may pose a risk of fire.

9		Do not block	It is used in situations where a possible obstacle would create a particular hazard (on an escape route, in emergency exit, at access to firefighting equipment etc.).
10		Do not use water to put out the fire	The sign is used in all cases where the use of water for fire extinguishing is prohibited.
11		Danger of explosion. Explosives	The sign indicates the possible presence of explosive atmosphere, flammable gases or explosive materials.
12		Danger of fire. Flammable materials	The sign indicates the presence of flammable materials.
13		Danger of fire. Oxidizing materials	The sign indicates the presence of oxidizing materials.

## Raising an alarm

Anyone who sees a fire or gets information about a fire should keep calm, not panic and immediately alert:

- **FIRE BRIGADE - tel. 998 or 112,**

Once you contact the fire brigade, you should state:

- a) the place of fire - accurate address and name of the building,
- b) what is on fire,
- c) whether there is a risk of people's life, of if flammable or explosive materials are stored in the area of fire or the surroundings,
- d) The number of phone number from which you speak and your name.

If necessary, alert:

- FIRE BRIGADE - 998 or 112
- AMBULANCE - 999 or 112
- POLICE - 997 or 112
- POWER SUPPLY EMERGENCY SERVICE - 991
- WATER and SEWAGE EMERGENCY SERVICE - 994
- GAS SUPPLY EMERGENCY SERVICE – 992

## **THE ALARM SIGNAL FOR EVACUATION WILL BE TRANSMITTED BY THE SOUND WARNING SYSTEM.**

THE SIGNAL WILL BE ACTIVATED AUTOMATICALLY ONCE ANY OF THE FIRE ALERT BUTTONS LOCATED IN THE STAIRWAYS IS PRESSED (activating the 2nd level of the fire alarm system results in the evacuation alert signal and sending information to Szczecin headquarters of the fire brigade).

**In special cases the alarm should be announced with a loud and clear shout:  
"UWAGA, UWAGA OGLASZAM EWAKUACJĘ"  
(meaning: "ATTENTION, ATTENTION, I AM ANNOUNCING EVACUATION").**

Besides, there is a *fireman's* microphone of the public address system for voice announcements.

### **Evacuation from the building**

Evacuation from the building:

- a) If you notice a fire, immediately inform:
  - co-workers staying in the immediate neighbourhood,
  - the other personnel in the building,
  - visitors to the building.
- b) Evacuation of all rooms should proceed in the direction shown by the emergency exit signs,
- c) Do not push other evacuating persons in rooms, corridors and at emergency exits,
- d) Do not roll over chairs or tables to avoid obstructing the escape route,
- e) Keep calm as far as possible, do not use sensitive words that may trigger panic.

If escape routes are filled with smoke, move in an inclined position keeping your head possibly close to the floor as there is less smoke. If possible, cover your mouth and respiratory track (airways) with wetted handkerchief as this facilitates breathing. Moving through escape routes with dense smoke, walk along the walls so as not to lose the right direction.

Until the fire brigade arrives - the rescue and firefighting operation shall be arranged by the Rector. If the Rector is absent, this duty of on-scene coordinator is assumed by a person authorized by the Rector, or if they are absent too, anybody who has already taken this responsibility (a person capable of taking command, calm and determined).

**DURING A RESCUE AND FIREFIGHTING OPERATION ALL PERSONS WITHIN THE SCENE SHALL OBEY THE ON-SCENE COORDINATOR.**

### **Responsibility of the personnel**

ALL EMPLOYEES, REGARDLESS OF THE POSITION IN THE COMPANY, HAVE THE FOLLOWING DUTIES, RESPONSIBILITIES AND TASKS IN RELATION TO FIRE PROTECTION

- know the hazards in their workplace, and methods of preventing a fire to occur or spread.
- know the rules of action if a fire occurs,
- be aware of the location of extinguishers and internal hydrant installation,

- know the conditions of safe evacuation of persons and property,
- participate in an fire fighting and rescue operation and obey the commander (on-scene co-ordinator),
- participate in fire training sessions,
- report faults and damage that might cause fire to persons authorized to rectify such faults,
- comply with the existing fire safety regulations and instructions as required in the position held,

Furthermore, the workers shall:

- know the existing fire safety regulations and instructions and control the compliance with such regulations and instructions,
- be responsible for the fire safety condition of all rooms used,
- regularly update the fire protection knowledge.