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SICUREZZA INCLUSIVA | HELP FOR ALL

A cura dell'Osservatorio Nazionale sulla Sicurezza e il Soccorso alle Persone con Esigenze Speciali
del Corpo Nazionale Vigili del Fuoco



National Technical
University of Athens



European Center for Forest
Fires, CoE/EUR-OPA Major
Hazards Agreement

Fire Safety and Evacuation Planning as a tool for coping with emergency situations: The case of people with disabilities

Dr Sofia Karma

National Technical University of Athens, GR

European Center for Forest Fires (ECFF), Council of Europe



**National Technical
University of Athens**



**European Center for
Forest Fires,
CoE/EUR-OPA Major
Hazards Agreement**

PART I: INTRODUCTION




NATIONAL TECHNICAL UNIVERSITY OF ATHENS (NTUA)

NTUA is the top Technical University in Athens, Greece founded in 1837

Field Analytical Chemistry and Technology Unit (FIACU) research group is situated at the School of Chemical Engineering, NTUA.

<http://fiactu.ntua.gr/>


FIACU/NTUA supports scientifically the European Center for Forest Fires (ECFF)

A horizontal banner image for the FIACU research unit. It contains five distinct images: a diagram of a chemical process with a flask and arrows, a close-up of interlocking mechanical gears, three Erlenmeyer flasks containing liquids of different colors (green, yellow, and red), a close-up of a microscope's objective lens, and a laptop computer displaying a green screen.


Field Analytical Chemistry and Technology Unit (FIACU)

Home


FIACU research unit is situated in the premises of the National Technical University of Athens, and focuses on the use and advancement of on-site chemical analysis. Much of the research work is based on exploring chemical methods and instrumentation that can be applied to potential environmental, health, as well as natural and man-made disaster management applications.

A photograph showing two researchers in white lab coats and hard hats working in a field. One is holding a piece of equipment, possibly a detector or sampling device.

FIACU and research on chemical human signatures

A dark image with text overlay. The text reads 'Second Generation Locator for Urban Search and Rescue Operations' and 'SGL for USAR Technologies for Heroes'.

FIACU and Search & rescue (SAR) operations

An aerial photograph showing a landscape with a body of water and some structures. A small vehicle or platform is visible on the water.

FIACU and chemical detectors on board aerial vehicles

FIACU Research field: chemical methods and instrumentation for environmental, health, or natural and man-made disaster management applications



EUROPEAN CENTER FOR FOREST FIRES (ECFF)/EUR-OPA

ECFF was inaugurated in Athens, Greece in 2003 (<http://civilprotection.gr/en/ecff>)

It operates in the framework of **EUR-OPA Major Hazards Agreement of the Council of Europe**, ratified by the Greek Law 2031/92(<http://www.coe.int/en/web/euoparisks/specialised-centres>)

ECFF Director:

Prof Milt Statheropoulos, School
of Chem. Engineering, NTUA
Email: stathero@chemeng.ntua.gr

ECFF Research Associate,
Responsible of Scientific Issues:

Dr. Sofia Karma
*Laboratory Teaching Staff at
Chem. Eng. NTUA*

Email: skarma@central.ntua.gr



ECFF MISSION

- **Improve population awareness upon disaster risks**, focusing on risks from forest fires and the produced smoke
- **Contribute with policies to increase coping and adaptive capacity of the exposed communities**, so that to reduce their vulnerability upon forest fires hazard

ECFF SPECIFIC OBJECTIVES

- **Exposure assessment of smoke and health impacts** on fire-fighters and civilians
- **Safety planning against risks from forest fires or other related risks**, focusing on **vulnerable groups of population** (such as people with disabilities)
- **State-of-the art methods and cutting edge technologies for early detection of hazardous environments** and for monitoring human exposure

ECFF is accommodated and run at the headquarters of the **General Secretariat for Civil Protection, Hellenic Ministry of Interior**



<http://civilprotection.gr/en/home>



ECFF PUBLICATIONS

ECFF has published so far 7 Volumes of **Forest Fire Net (FFNet)** dedicated to forest fire and smoke issues, with experts participation as guest editors

All volumes are free downloaded at:
<http://civilprotection.gr/en/ecff>



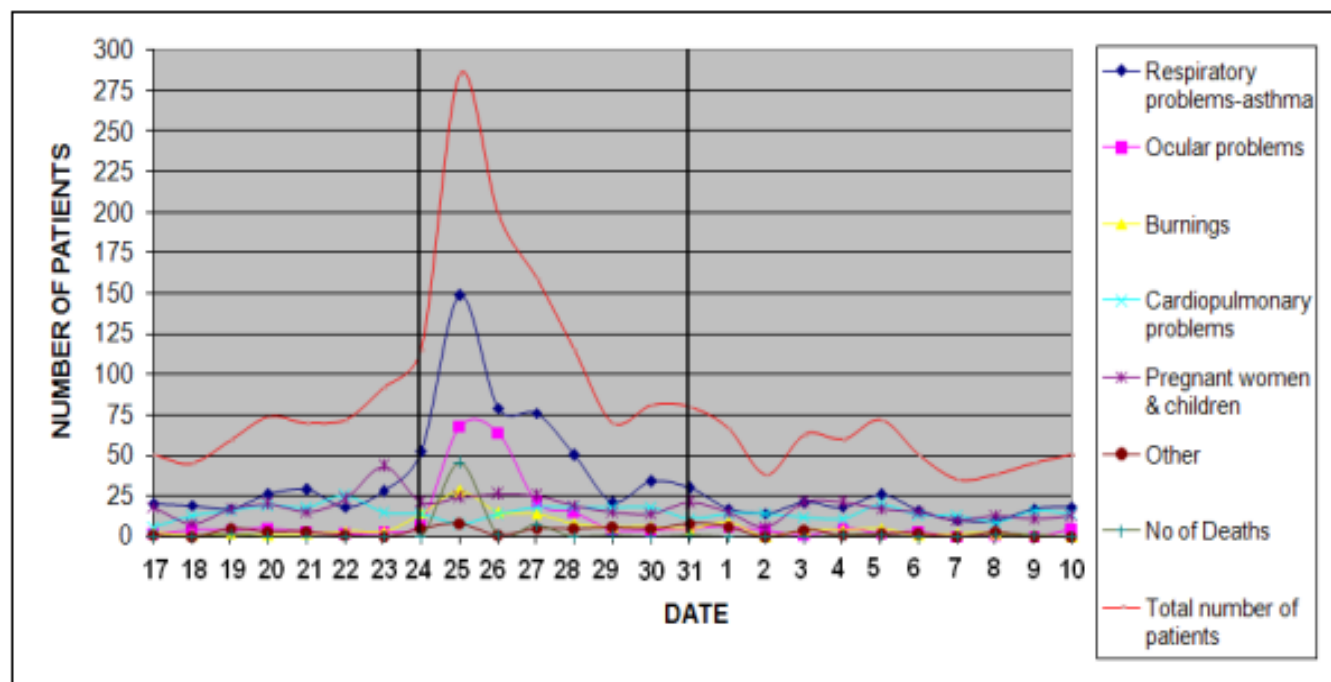
List of FFNet volumes

- **FFNet 1 (2003):** “Inauguration of ECFF”
- **FFNet 2 (2004):** “Lessons learned” from the large scale forest fires in summer 2003 in Europe
- **FFNet 3 (2005):** “Short & Long term health impacts of forest fire smoke on fire-fighters and the exposed population”
- **FFNet 4 (2006):** “Air quality monitoring in the field and personal protective equipment in big forest fire incidents: a state-of- the art and beyond”
- **FFNet 5 (2007):** “Forest fires in Greece during summer 2007: The data file of a case study”
- **FFNet 6 (2009):** “Human rights in Disasters: Search and Rescue Operations in Disasters especially for vulnerable people”
- **FFNet 7 (2010):** “Recent Developments and Needs for Wildfire Fighting on the Ground: Tactics and Technologies”

Indicative FFNet volumes

- Volume 5

“Forest fires in Greece during summer 2007: The data file of a case study”



Profile of the number of admissions and number of deaths according to 19 medical centers and hospitals of Peloponnese in between the 17th of August to the 10th of September 2007

- **Volume 6**

“Human rights in Disasters: Search and Rescue Operations in disasters especially for vulnerable people”

A special issue with the proceedings of the workshop, organized in Athens, 5-6 of November 2009 by the:

- Open Partial Agreement (OPA) of the Council of Europe (CE), **ECFF**
- General Secretariat for Civil Protection, Greece (**GSCP**)
- National Technical University of Athens, Greece (**NTUA**),
Second Generation Locator for Urban Search and Rescue operations –**“SGL for USaR”** (EU FP7 project) <http://www.sgl-eu.org/>



Agenda of the Workshop

- Human rights and disasters : An overview
- Adapting search and rescue operations:
 - How to search and rescue the elderly and people with disabilities (e.g. mobility problems, sight or hearing impairment)
 - What are the existing approaches
 - Identify the gaps
 - Define new requirements
- Enhancing emergency plans
- Preparedness and preventive measures
- Building a common understanding- Recommendations



SGL for USaR
(<http://fiactu.ntua.gr>)

Catalogue of ideas

- **A data-bank of home and working addresses** of PwD can be prepared and provided to the municipalities and central operational services, considering the issue of personal data protection
- **There is a significant differentiation among EU countries regarding existing prevention measures and operational procedures** for protecting vulnerable groups of population.
- A number of simplified measures to facilitate evacuation in emergencies could be:
 - The working place of **PwD** could be chosen to be only on the **ground floor of the building**
 - A **colleague of them could be assigned** to help them evacuate the building in emergency
- **Training of the human environment of people with disabilities is vital.**
Families, school environment and occupation environment of those people should be aware of elementary guidelines for helping them in case of emergency

EUROPEAN CENTER FOR FOREST FIRES (ECFF)/EUR-OPA



ECFF PROJECTS

- **2012-2013: “Development of Guidelines for the Defense of Rural Populations, Settlements and other Assets Against Wildfires and Smoke Pollution”**

A booklet has been prepared in cooperation with the Global Fire Monitoring Center, Germany (GFMC) entitled:

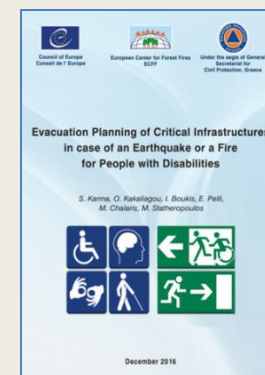
“Defence of Villages, Fars and Other Rural Assets against Wilfires: Guidelines for Rural Populations, Local Communities and Municipality Leaders in the Balkan Region”



- **2016-2017: “Basic Principles of Building Aseismic Code, Evacuation planning of critical infrastructures in case of an Earthquake or a Fire”** in cooperation with the European Centre on Prevention and Forecasting of Earthquakes (ECFPE), GR.

A book has been published by ECFF (ISBN: 978-618-83079-0-2), entitled:

“Evacuation Planning of Critical Infrastructures in case of an Earthquake or a fire for People with Disabilities”



- **2018-2019: “Fine and Ultrafine particles from forest fires: Recommendations/Guidelines for protection of vulnerable groups of population”**

PART II: EMERGENCY RESPONSE FOR ALL



**National Technical
University of Athens**



**European Center for Forest
Fires**

PEOPLE WITH DISABILITIES IN DISASTERS

- **The EU strategy on Disability (Disability Action Plan) includes:**
 - Full implementation of the **Employment Equality Directive**
 - Successful **mainstreaming of disability issues** in relevant community policies
 - Improving accessibility for all (**“UNIVERSAL DESIGN”** or **“DESIGN FOR ALL”**)

PEOPLE WITH DISABILITIES IN DISASTERS

- **Priorities based on Sendai Framework of UN for Disaster Risk Reduction 2015-2030**
 - ***Priority 1. “Understanding disaster Risk”***: Promote awareness raising among vulnerable groups, such as people with disabilities
 - ***Priority 4. “Enhancing disaster Preparedness”***: Inclusion of people with disabilities in Disaster Management Cycle (preparedness & response phases) to reduce their vulnerability

MAJOR HAZARDS & PEOPLE WITH DISABILITIES-A TOOLKIT FOR GOOD PRACTICE, EUR-OPA, CoE

Guidance and examples of good practice for civil protection professionals, decision-makers and people with disabilities, has recently prepared.

Sendai Framework for Disaster Risk Reduction 2015-2030
Third United Nations World Conference on Disaster Risk Reduction at Sendai, Japan, **18 March 2015**

Available at:
<https://www.coe.int/en/web/euoparisks/-/major-hazards-and-people-with-disabilities-a-toolkit-for-good-practice>



Silvio Sagramola
David Alexander
Ilan Kelman

**MAJOR HAZARDS
AND PEOPLE
WITH DISABILITIES**
A toolkit for good practice



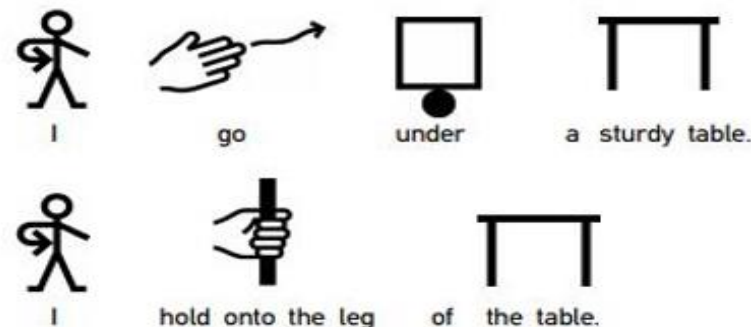
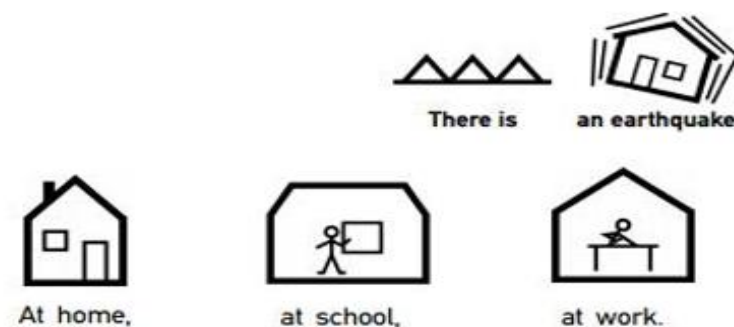
EARTHQUAKE PROTECTION MEASURES IN “EASY TO-READ” LANGUAGE FOR PREPAREDNESS & RESPONSE OF PWD

Part of a leaflet with Earthquake Protection Measures in “easy-to-read” language for preparedness and response of people with disabilities (“**MAKATON**” language program)

Prepared by the European Center on Prevention and Forecasting of Earthquakes (ECPFE)/CoE

Available at:

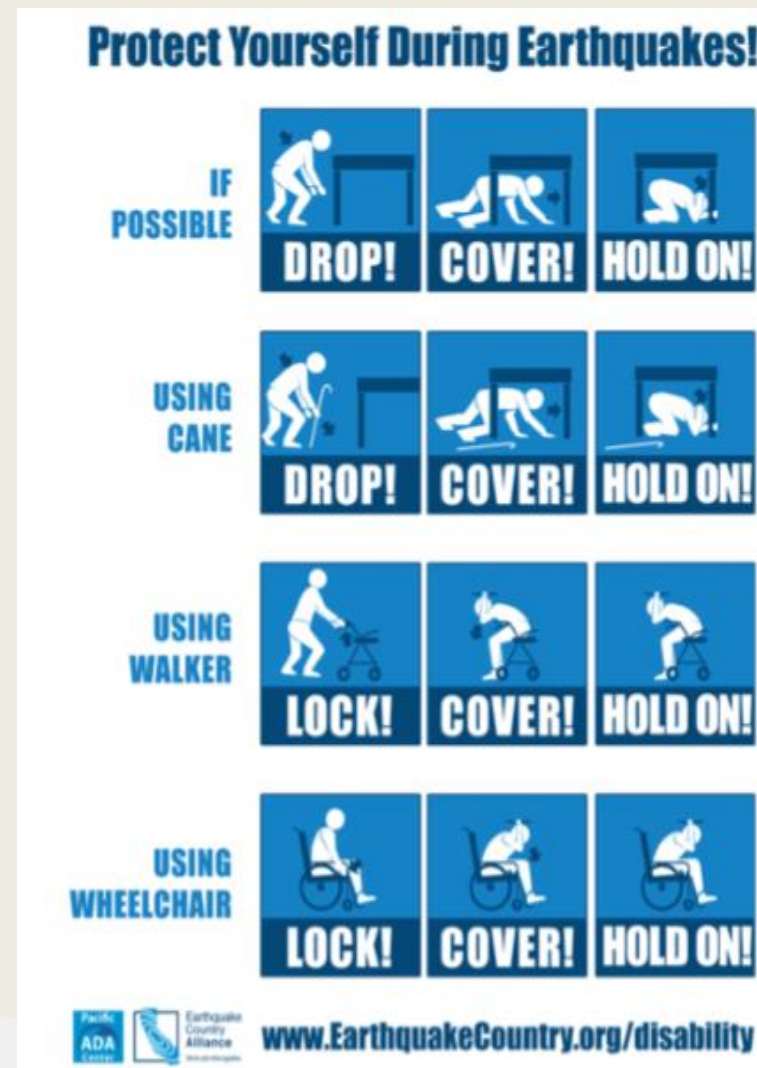
http://www.oasp.gr/userfiles/OASP%20MAKATON_20selido%20ENGLISH-NEW.pdf



EARTHQUAKE PREPAREDNESS GUIDE FOR PWD & OTHER ACCESS OR FUNCTIONAL NEEDS (ADA, USA)

Resources for people with disabilities and other access and functional needs

Available at:
<http://www.earthquakecountry.org/disability/>



WORKSHOP : “EVACUATION OF BUILDINGS IN CASE OF EMERGENCY FOR PEOPLE WITH DISABILITIES

- **Date:** 31/10/2017
- **Organizers:** Joint effort among
National Technical University of Athens, General Secretariat for Civil Protection
European Center for Forest Fires ECFF/EUR-OPA
- **Place:** Multimedia Auditorium, Library, NTUA, Athens
- **Main Scope:** Increase awareness of people with disabilities (PwD) and their active participation in disaster preparedness





**Conference: Evacuation of Buildings in case of Emergency
for People with Disabilities
31st October 2017 – Greece**

Greeting Note from Gianluca Silvestrini
Executive Secretary of the European and Mediterranean Major Hazards Agreement

Again in 2017, Greece and its citizens have continued to endure considerable damage and heartache as the result of wildfires, such as those in Kalamos, and large magnitude earthquakes as seen on the islands of Lesbos and Kos.

The European and Mediterranean Major Hazards Agreement (EUR-OPA) stands ever ready to support the Greek authorities in facing and successfully overcoming these major hazards. Through continuing cooperation we will ensure that Greece is supported to prevent, prepare and protect itself from future disasters. As Executive Secretary of the EUR-OPA Major Hazards Agreement, I welcome the Greek initiative to organise this highly important event. This conference provides an invaluable opportunity to highlight the wide range of work concerning the Greek authorities, stakeholders and associations representing the disabled community that has been implemented under the EUR-OPA framework by our Specialised Centres. Improving

- **Greeting from
EUR-OPA**

**Part of the Greeting
Note from Gianluca
Silvestrini, Executive
Secretary of the EUR-
OPA Major Hazards
Agreement**

- **Highlights from the workshop**



Workshop entitled “Evacuation of Buildings in Case of Emergency for People with Disabilities”, 31st of October 2017, NTUA, Athens

Photos available at: <http://civilprotection.gr>

- Highlights from the workshop



Photos available at: <http://civilprotection.gr>

- **Representatives from the Disability Community**

- ✓ Center for Education & Rehabilitation for the Blind (KEAT)
- ✓ Panhellenic Association of the Blind (PST)
- ✓ School of Primary Special Education for children with cerebral palsy, at the premises of Cerebral Palsy Greece
- ✓ ELEPAP (Rehabilitation for The Disabled)
- ✓ Greek National Confederation of Disabled People (ESAMEA)
- ✓ Lighthouse Greece and Amimoni (Panhellenic Association of Parents and Friends of the Visually Impaired People with Additional Special Needs)

- **Workshop Perspective based on the Sendai Framework on Disaster Risk Reduction 2015- 2030**

- ✓ **Contribute to:**

- Priority 1: “Understanding disaster Risk”:**

- By promoting awareness raising among vulnerable groups, such as people with disabilities*

- Priority 4: “Enhancing disaster Preparedness for effective response”:**

- By including people with disabilities in Disaster Management Cycle (preparedness & response phases) to reduce their vulnerability*

- ✓ **Share the "Home Safe Home" motto** of the International Day for Disaster Reduction 2017 (13 of October)

- **Workshop Specific Objectives**

- ✓ **Dissemination of knowledge and know-how, based on the book:**



Prepared by ECFF and ECPFE EUR-OPA Centers,
GSCP and Hellenic Fire Service

Authors:

*S. Karma, O.Kakaliagou, I. Boukis, E. Pelli, M.Chalaris,
M.Statheropoulos*

“Evacuation planning of critical infrastructures in case
of an earthquake or a fire for people with disabilities”

- **Workshop Specific Objectives**

- ✓ **Promote dialogue** among experts and representatives from the disability community on the issue of emergency response for people with disabilities
- ✓ **Promote disaster preparedness among interested parties**, such as families, special education teachers, individuals that take care of people with disabilities and of course people with disabilities
- ✓ **Educate possible involved parties on safe evacuation procedures**, by following practical guidelines.

- **Workshop Specific Objectives**

- ✓ **Create a network of people and organizations** that share the same interest on emergency response for people with disabilities
- ✓ **Gather existing proposals and practical solutions** based on experience and know-how from representatives from disaster management community and from other individuals
- ✓ **Address limitations and gaps** so that to examine possible practical solutions for the future, such as **new educational methods, recommendations, or guidelines** for reining in disasters impacts for people with disabilities (especially for children)

- **Draft outcomes of the workshop**
- ✓ **Possible information and communication means** to foster awareness of PwD on disaster response were proposed, e.g. **information campaigns**.
- ✓ The **difficulties experienced when working with children with disabilities** for information purposes, as well as related pedagogical issues were mentioned, acknowledging the **importance of an interdisciplinary approach**.

- **Draft outcomes of the workshop**

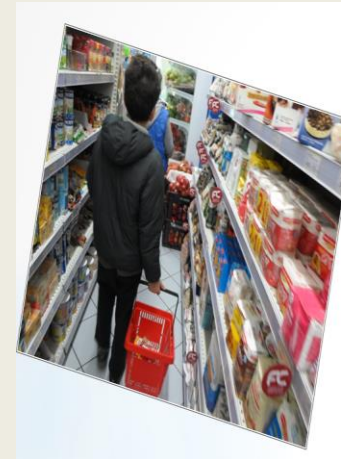
- ✓ **The need to strengthen the institutional framework and to conduct drills** and run simulated exercises in relevant evacuation scenarios was highlighted, in order to identify possible gaps and problems.
- ✓ **The need to develop registration and tracking systems for PwD** was also proposed and discussed, along with the related **legal-ethical issues**.

- **Draft outcomes of the workshop**
- ✓ **The active participation of PwD in the disaster management cycle** especially in the prevention and response phases was considered a crucial factor for successful planning of the existing and the anticipation of new disaster risks.
- ✓ **The importance of future meetings among academics, experts, operational people and civil protection representatives** with disability community delegates was unanimously agreed

- Other issues of the workshop

The “**CUIDAR**” European project (H2020, No 653753) for Enhancing Preparedness & Resilience of **children in disasters**, with special mention to children with disabilities was presented

The CUIDAR PROJECT
<http://www.lancaster.ac.uk/cuidar/el/>



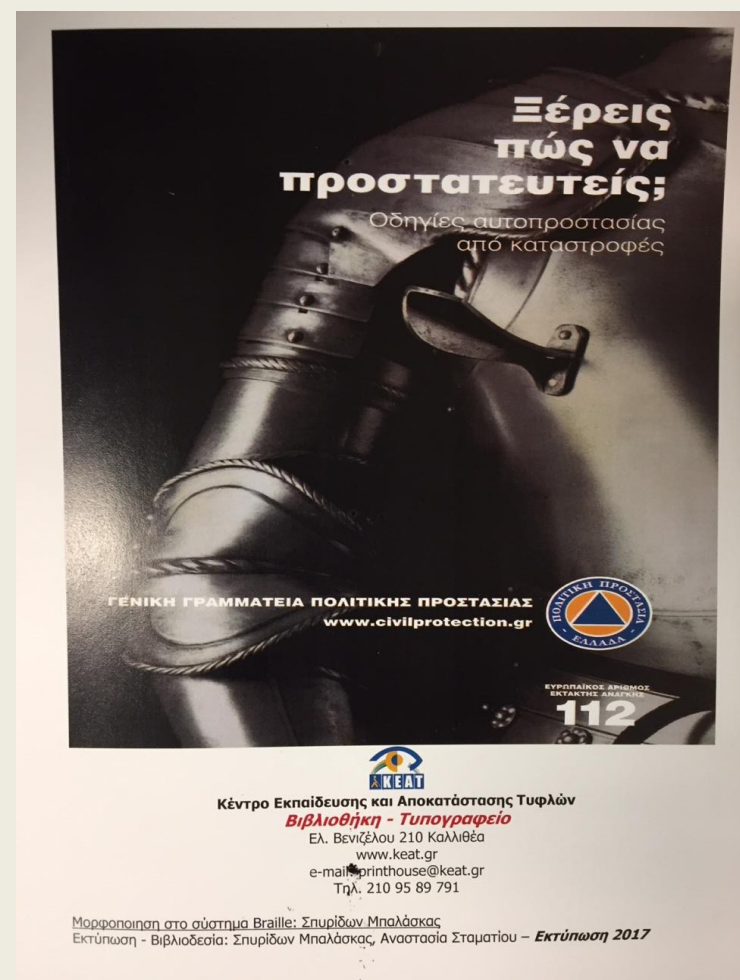
• Other issues of the workshop

- ✓ The first edition of the **self-protection guidelines** against natural disasters, technological accidents and CBRN incidents **in Braille** was presented.
- ✓ The book **“Do you know how to protect yourself?”** is issued by the General Secretariat for Civil Protection (GSCP) in Greek and English.

The edition is a result of the **collaboration of the GSCP with the Center for Education & Rehabilitation for the Blind.**



“Do you know how to protect yourself?”



Self-protection guidelines against natural disasters, technological accidents and CBRN incidents **in Braille**

GSCP INFO MATERIAL FOR RAISING PUBLIC AWARENESS IN EMERGENCIES



- Self Protection Guidelines

GENERAL SECRETARIAT
FOR CIVIL PROTECTION

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G.S.C.P. Self Protection Guidelines Volunteering International Cooperation

HOME / SELF PROTECTION GUIDELINES

Self Protection Guidelines

EARTHQUAKES

LANDSLIDES

FOREST FIRES

FLOODS

Weather

Volcanoes

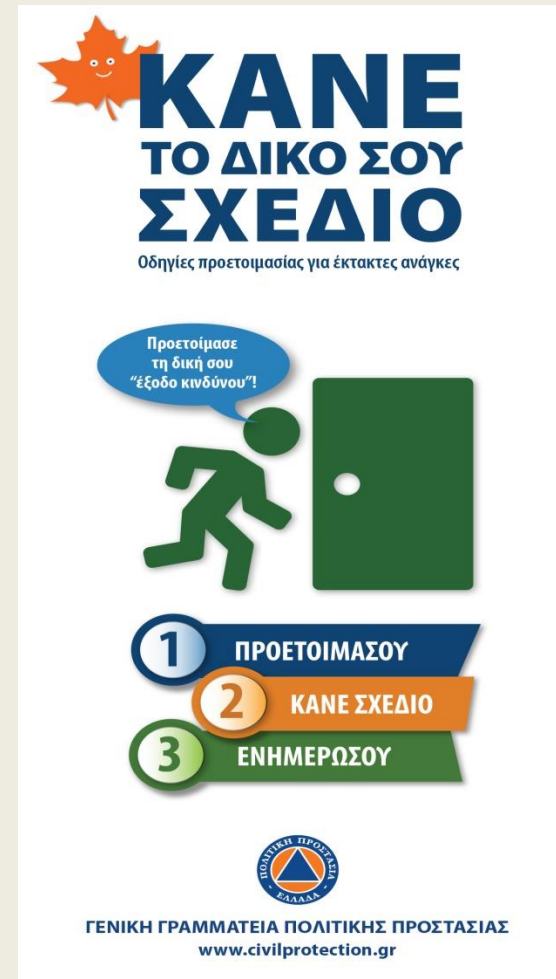
Industrial Accidents

Nuclear accidents

<http://civilprotection.gr/en/disasters>

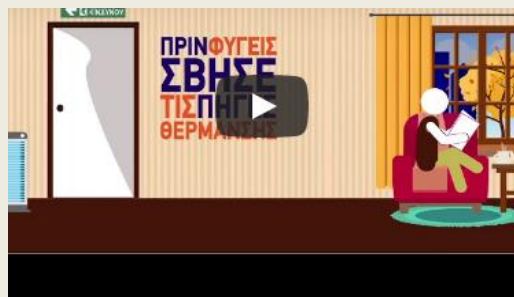
- **Self Protection Guidelines**

Prepare your “Personal Evacuation Plan”





Emergency Response Videos



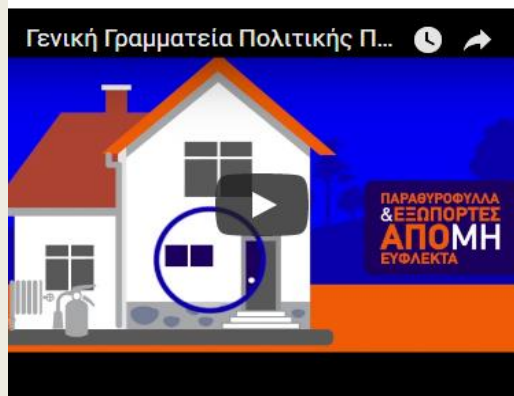
Για ασφαλή θέρμανση το χειμώνα-Προετοιμάσου



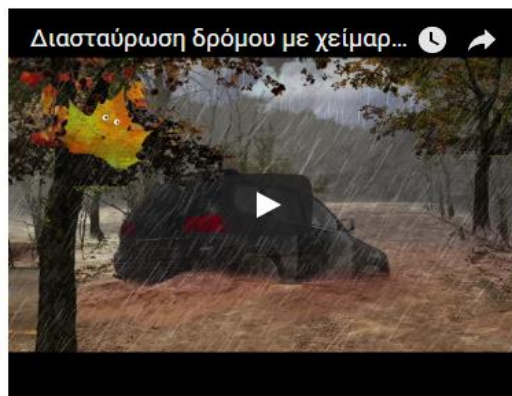
Ταξιδεύεις το Χειμώνα-Προετοιμάσου



Δασικές Πυρκαγιές: Ημερήσιος Χάρτης Πρόβλεψης Κινδύνου Πυρκαγιάς



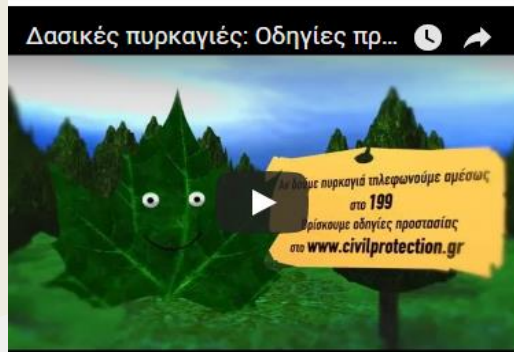
Δασικές Πυρκαγιές: Προετοιμάσου



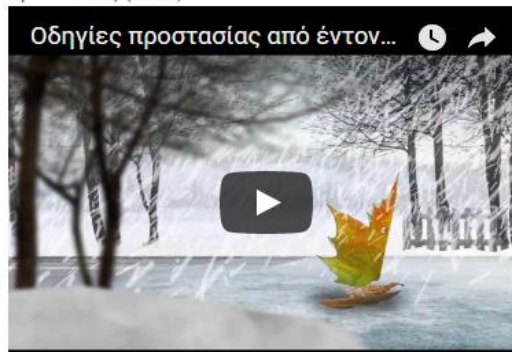
Διασταύρωση δρόμου με χείμαρρο - Οδηγίες προστασίας (2016)



ΓΓΠΠ



Δασικές πυρκαγιές: Οδηγίες προστασίας



Οδηγίες προστασίας από έντονους χιονοπτώσεις



112 European Emergency Number

PART III: FIRE SAFETY & EVACUATION PLANNING



**National Technical
University of Athens**



**European Center for
Forest Fires**

FIRE SAFETY MANAGEMENT & EMERGENCY RESPONSE PLANS (ERPs)

- **ERPs are crucial** for coping with emergency situations such as **fire, earthquake etc.**
- An Emergency Preparedness and Response Plan includes **all the actions that need to be considered** before, during and after the emergency.

Part of an ERP is the **“Fire Escape Plan”** or **“Escape Plan”** of a building.

ESCAPE ROUTES and EMERGENCY EXITS are indicated with specific ESCAPE SIGNS to help evacuation procedure



Escape sign indicating the escape route towards the Emergency Exit

EVACUATION PLANNING IN EMERGENCIES: GUIDELINES FOR PEOPLE WITH DISABILITIES (PWD)

According to the **National Fire Protection Agency, USA** (NFPA), in case of an emergency situation where the evacuation of a building is necessary, there are some vital questions that need to be answered:

- **Is there an emergency?**
- **What is the emergency?**
- **How to respond to the emergency?**
- **Where is the way out?**
- **How can I move to a safe place?**
- **Alone, or assisted?**

(NFPA Public education, People with Disabilities, “ NFPA, DARAC, Emergency Evacuation Planning Guide for People with Disabilities, June 2016 <http://www.nfpa.org/public-education/by-topic/people-at-risk/people-withdisabilities>)

PERSONAL EMERGENCY EVACUATION PLAN (PEEP) FOR PWD

- **A PEEP** can be used as a **tool for enhancing emergency preparedness and response** of a disabled person.
- **The PEEP** must be **adjusted to the specific needs of the disabled person** based on the type of disability such as:
 - Mobility impairment
 - Visibility impairment (blind or low vision)
 - Hearing impairment (deaf or hard hearing)
 - Speech impairment
 - Cognitive impairment

TIPS FOR PREPARING A PEEP FOR A PERSON WITH DISABILITIES

1. **Define** primary and alternative **Accessible Escape Routes**
2. **Accessible Refuge Areas** need to be highlighted
3. **Notifications Systems** of the building need to be located (alarms, bells, speaker, light, etc.)
4. **Type of assistance** needed during evacuation in case of emergency must be defined
5. **Be sure that this person** is aware and **understand** all the above information
6. **TRAINING IS VERY IMPORTANT** FOR A PEEP TO BE EFFECTIVE



Fig. 9 Fire alarm notification system

SAFE EVACUATION FOR ALL- PROPOSALS



- ✓ **Simple floor plans** of the building indicating **escape routes** should be available at the entrance of a building for PwD, informing on the existence of an evacuation plan (*Fire Escape Plan*)
- ✓ **Additional exit signs and directional exit signs** should be located at a **reasonable height**, so they can also be easily visible by a wheelchair user
- ✓ **Egress signs in tactile and/or Braille language** can be added so that to be readable by people with visibility impairments

Egress signs in tactile and/or Braille

(NFPA, Emergency Evacuation guide for people with disabilities, June 2016)



SAFE EVACUATION FOR ALL- PROPOSALS

- ✓ **Handrails** can be added on corridors, ramps or stairs for helping mobility impaired people to support during evacuation
- ✓ **Portable ramps** for stairs, semi-permanent or temporary, could be installed at buildings that were not originally designed with accessibility standard
- ✓ **Evacuation chairs** may be needed to reach ground level during evacuation



**Portable ramps for
wheelchair users**



**Evacuation chair for
mobility impaired (Red
Hawk Training)**

EGRESS SIGNS FOR BUILDINGS EVACUATION DESIGNED FOR PWD IN LIGHT OF “UNIVERSAL DESIGN”



*Exit sign showing an accessible exit
(ISO 21542:2011 Building construction - Accessibility
and usability of the built environment)*



*Accessible means of Egress Icon: “Running
man” and “wheelchair user” **are moving
quickly together towards the exit***



Evacuation Signs for People with
Disabilities: **The “Accessible Exit
Sign Project”**

<http://accessibleexitsigns.com/>

PROPOSED EGRESS SIGNS FOR PWD:THE ACCESSIBLE EXIT SIGN PROJECT

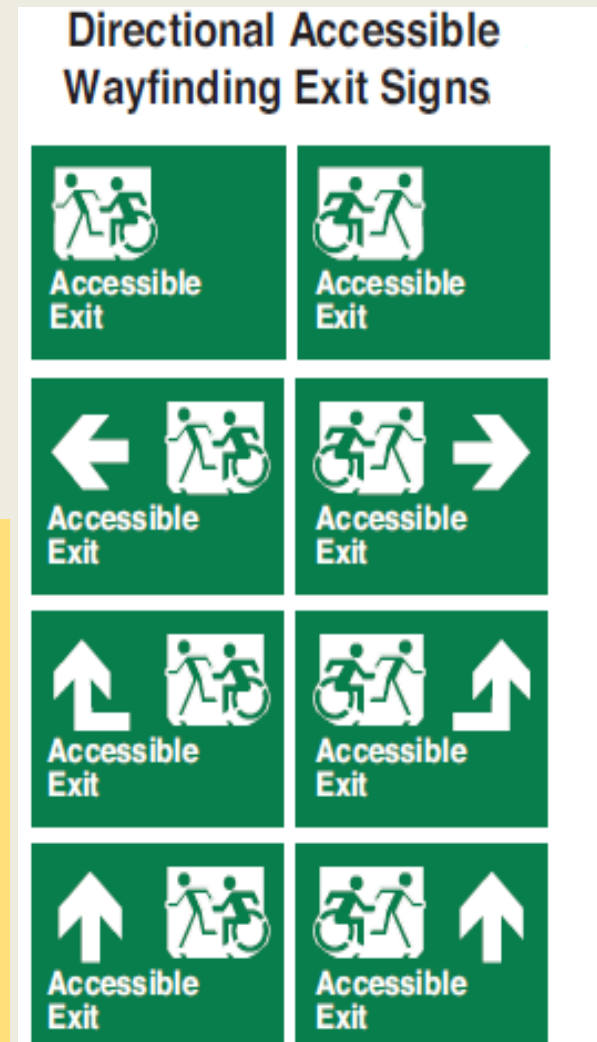


Exit Door Signs



Refuge Area Signs

- Installed at a midlevel accessible height range on the wall, e.g. by people with visibility problems
- Braille and tactile characters are provided



Wayfinding Exit Signs

INDICATIVE “FIRE ESCAPE PLAN ” WITH INCLUSION OF THE NEWEST PROPOSED ACCESSIBLE EXIT SIGN PROJECT EGRESS SYMBOLS

- ✓ **The proposed “Fire Escape Plan”** is based on the last updated International Standard, ISO 23601:2009 (Safety identification - Escape and evacuation plan signs), incorporating also the newest proposed egress symbols for disabled people

Escape Routes for **BOTH** the general population and the people with disabilities **are provided in the ground plan presented in Annex 2**



EUROPEAN CENTER for FOREST FIRES

Under
the aegis of the



GENERAL SECRETARIAT FOR
CIVIL PROTECTION, GREECE



COUNCIL OF EUROPE

Annex 2 / Παράρτημα 2



Indicative example of a “Fire Escape Plan” based on the last updated International Standard, ISO 23601:2009 with incorporation of the newest proposed egress symbols for disabled people

CONCLUSIONS

- ✓ It seems that **there is a need for future ISO standards relevant to building evacuation** and the corresponding **“Fire Escape Plans”** considering also **PwD**.
- ✓ Special attention should be paid to **critical infrastructures**, such as hospitals, airports etc.



Escape Signs for both disabled and the general population can be integrated in the same Fire Escape Plan

Thank you for your Attention!!

Grazie per l'attenzione!



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