The background of the poster is a detailed woodcut illustration by M.C. Escher titled 'Relativity'. It depicts a complex, multi-level architectural structure with various staircases and platforms. Several figures are shown in different orientations, some walking on stairs that are not parallel to the ground, illustrating the concept of multiple, conflicting perspectives of gravity and space.

**17<sup>th</sup> EAN Workshop (joint with NERIS)**

# **ALARA**

**in Emergency Exposure Situations**

***15 – 17 May 2017, Lisbon, Portugal***

Instituto Superior Técnico  
Tecnológico e Nuclear Campus  
Bobadela, Portugal



European ALARA Network



European Platform on Preparedness  
for Nuclear and Radiological Emergency  
Response and Recovery



# I European ALARA Network 17<sup>th</sup> Workshop

## ALARA in Emergency Exposure Situations

Emergency exposure situations can arise as a result of a nuclear accident, a malicious or terrorist act, or any other unexpected radiological event. It requires a quick response and sustainable countermeasures and remedial actions in order to avoid or reduce adverse short-term and long-term consequences. Radiation exposures can be received by the public, first responders, workers and volunteers engaged in the post-accident recovery.

The ICRP recommendations and European Basic Safety Standards – the bases for national regulations - re-emphasize the principle of optimisation (ALARA) as applying to emergency exposure situations. For the purpose of radiological protection, reference levels for emergency exposure situations should be set. More importantly, it is necessary to establish emergency plans based on an optimum protection strategy, resulting in more good than harm for the exposed people and the affected territories. In that perspective, lessons learnt from the Fukushima accident are of utmost importance.

The objectives of the workshop are:

- To show, in particular from the experience of Fukushima accident, the challenges posed by the optimisation of exposures in emergency and post-accident situations;
- To review the national arrangements for assessing, monitoring and mitigating the radiological consequences of an emergency, especially with regard to applying the ALARA principle to public and occupational exposures;
- To review the arrangements for managing emergency doses to workers
- To review the arrangements for providing ALARA-based training for the different types of stakeholders who would be engaged in the emergency response and long-term recovery actions.

The workshop will consist of presentations (oral and posters) intended to highlight the main issues, and a significant part of the program will be devoted to discussions within working groups. From these discussions, participants will be expected to produce recommendations on ALARA in emergency exposure situations, which are addressed to relevant local, national and international stakeholders.

the programme

---

## the programme committee

---

Mr S. Andresz	Nuclear Evaluation Protection Centre (CEPN) (France)
Mr M. Capucho dos Reis	University of Lisbon, Technologic and Nuclear Campus (IST CTN) (Portugal)
Mr P. Croüail	Nuclear Evaluation Protection Centre (CEPN) (France) EAN Vice-Chairman
Mr F. Gering	German Nuclear Safety Authority (BfS) (Germany)
Mr A. Hefner	Seibersdorf Laboratories GmbH (Austria)
Mrs J. Morgan	Public Health England (United Kingdom) EAN Secretary
Mr C. Murith	Swiss Federal Office of Public Health (OFSP) (Switzerland)
Mrs A. Nisbet	Public Health England (United Kingdom)
Mr W. Raskob	Karlsruhe Institute of Technology (Germany)
Mr T. Schneider	Nuclear Evaluation Protection Centre (CEPN) (France) NERIS Chairman
Mr P. Vaz	University of Lisbon, Technologic and Nuclear Campus (IST CTN) (Portugal)
Mr F. Vermeersch	SCK•CEN Mol (Belgium) EAN Chairman

---

## the local organizing committee

---

Mr M. Capucho dos Reis	University of Lisbon, Technologic and Nuclear Campus (IST CTN) (Portugal)
Octávia Monteiro Gil	University of Lisbon, Technologic and Nuclear Campus (IST CTN) (Portugal)
Mr P. Vaz	University of Lisbon, Technologic and Nuclear Campus (IST CTN) (Portugal)

---

## I DAY 1: MONDAY 15<sup>TH</sup> MAY 2017



### BUS SHUTTLE FROM ORIENTE STATION → IST

Pick-up point: near AKI shop, at the end of the Oriente Station parking

Departure: 08 h 00

## I SESSION 1

### I SETTING THE SCENE — THE CHALLENGES POSED BY THE OPTIMISATION OF EXPOSURE IN EMERGENCY AND POST ACCIDENT SITUATIONS



**Chairpersons:** Mr F. Vermeersch and Mr T. Schneider

09:00



Welcome & Introduction

Mr P. Vaz, University of Lisbon, Technologic and Nuclear Campus (IST CTN) (Portugal)

09:10



EAN and ALARA in Emergency Exposure Situations

Mr F. Vermeersch, SCK•CEN (Belgium) & EAN Chairman

09:20



Presentation of the NERIS platform

Mr T. Schneider, CEPN (France) & NERIS Chairman

09:30



Considerations for the Development of a Protection Strategy for a Nuclear or Radiological Emergency?


Mrs C. Robinson, International Atomic Energy Agency

09:50



Justification, Optimization and Management of Emergency Exposure Situations - an ICRP perspective

Mrs A. Nisbet, Public Health England (United Kingdom) & Member of TG 93 of the International Commission for Radiological Protection (ICRP)

10:10  Euratom Directive 2013/59 - Elements to be Included in a Emergency Management System  
Mr B. Patel, European Commission

10:30  CRPPH Working Party on Nuclear Emergency Matters  
Mrs C. McMahon, Environmental Protection Agency (Ireland)

10:50  **COFFEE BREAK**


## | SESSION 2

### | OVERVIEW OF EMERGENCY PREPAREDNESS IN EUROPE

 **Chairpersons:** Mr A. Hefner and Mr C. Murith

11:10  The French Doctrine for Nuclear Post-Accident Management: The Work of the CODIRPA  
Mrs N. Tchilian, French Nuclear Safety Authority (ASN) (France)

11:30  Optimised Protection Strategies in Nuclear and Radiological Emergencies – the German Example  
Mr F. Gering, German Nuclear Safety Authority (BfS) (Germany)

11:50  Emergency Preparedness In Austria in the light of the new European Basic Safety Directive including also the ALARA Approach  
Mr M. Dauke, AGES GmbH (Austria)

12:10  Setting Dose Reference Level for Emergency Responders in the United Kingdom  
Mrs S. Ely, Public Health England (United Kingdom)

12:30  Finnish Experience in Emergency Preparedness - Experience of Cooperation Results  
Mr J. Sovijärvi, Finnish Radiation and Nuclear Safety Authority (STUK) (Finland)

12 h 50  **LUNCH**

## I SESSION 3

### I EMERGENCY AND RESPONSE MANAGEMENT



**Chairperson:** Mr. F. Gering and Mrs. A. Nisbet

14:00



A Framework for Training of First Responders and Intervention Teams

Mr L. Portugal, Portuguese Environmental Agency (APA) (Portugal)

14:20



The EDF First Response Team (EDF FARN): Management of Radiological Risk in Emergency Exposure Situation

Mr P. M. Eymond, Électricité de France (France)

14:40



RODOS: Real Time Online Decision Support System for nuclear emergency management

Mr W. Raskob, Karlsruhe Institute of Technology (KIT) (Germany)

15:00



Using Modelisation of On-Site Consequences: the Example of Fluidyn-PANEPR Software

Mr C. Souprayen, Fluidyn co. (France)

15:20



Optimization and Robustness of Intervention Strategies

Mr C. Murith, Swiss Federal Office of Public Health (OFSP) (Switzerland)

### I WORKING GROUP

15:40



Introduction to Working Groups

Mrs J. Morgan and Mr P. Croüail, EAN

15:45



**COFFEE BREAK**

16:05



WORKING GROUP : FIRST SESSIONS

17:15

**End of day 1**

## I DAY 2: TUESDAY 16<sup>TH</sup> MAY 2017



**BUS SHUTTLE FROM ORIENTE STATION → IST**

**Pick-up point:** near AKI shop, at the end of the Oriente Station parking

**Departure:** 08 h 30

### I SESSION 3 (CONTINUED)

#### I EMERGENCY AND RESPONSE MANAGEMENT



**Chairpersons:** Mr F. Gering and Mrs A. Nisbet

09:00



Modelling of Nuclear Accident Consequences on Freshwater Bodies

Mr E. Gallego, University of Madrid (Spain)

09:20



World Health Organization Recommendations on Iodine Potassium Intake

Mrs Z. Carr, World Health Organization

09:40



The Experience of Activities of Q&A about Radiation in Daily Life after Fukushima Daiichi Nuclear Power Plant Accident

Mr T. Kono, Japan Atomic Energy Agency & Young Researcher Association, Japan Health Society (Japan)

10:00



Radioactivity from Fukushima Nuclear Accident Detected in Lisbon: Concerns of and Communication with the Public

Mr M. Capucho dos Reis, University of Lisbon, Technologic and Nuclear Campus (IST CTN) (Portugal)

10:20



**COFFEE BREAK**

### I SESSION 4

#### I THE POST-ACCIDENT PHASE – MANAGEMENT OF RADIOLOGICAL CONSEQUENCES



**Chairpersons:** Mr W. Raskob and Mr S. Andresz



- 10:50  Responders On-Site in the Late Phase after an Accident - The ALARA Approach  
Mr J. F. Lecomte, French Radiation Protection and Safety Institute (IRSN) (France)
- 11:10  ERMIN: European Model for Inhabited Areas: Use within a Wider Decision Making Framework  
Mr T. Charnock, Public Health England (United Kingdom)
- 11:30  Strategy for the Management of Contaminated Food: the EURANOS Handbook  
Mrs C. Organo, Environmental Protection Agency (EPA) (Ireland)
- 11:50  The Use of Electronic Dosimeter for Individual Exposure Assessment and Management after a Nuclear Accident: the Example of the D-Shuttle in the Fukushima Prefecture  
Mr W. Naito, National Institute of Advanced Science and Technology (AIST) (Japan)
- 12:10  Post-Chernobyl Countermeasures and Management in Belarus  
Mr V. Averin, Institute of Radiology (RIR), (Belarus)
- 12:30  Implementing Optimisation in Post-Accident Situation: Some Lessons from Fukushima  
Mr T. Shogo, Japan Atomic Energy Agency (Japan)

12:50  **LUNCH**

## I WORKING GROUP


14:00  WORKING GROUP: SECOND SESSION

15:30  **COFFEE BREAK**

16:00  WORKING GROUP SECOND SESSION (*continued*)

17:00 **End of day 2**

17:30

 BUS SHUTTLE FROM IST → LISBON CITY CENTRE

Departure: 17 h 30



WORKSHOP DINNER AT MUSEU DA CERVEJA RESTAURANT



BUS SHUTTLE FROM LISBON CITY CENTRE → ORIENTE STATION

Departure: *to be decided*

## | DAY 3: WEDNESDAY 17<sup>TH</sup> MAY 2017



BUS SHUTTLE FROM ORIENTE STATION → IST

Pick-up point: near AKI shop, at the end of the Oriente Station parking

Departure: 08 h 30

### | SESSION 5

### | CONCLUSIONS AND RECOMMENDATIONS



Chairpersons: Mrs J. Morgan and Mr P. Croüail

09:00



Reports from Working Group (20 minutes each)  
Rapporteurs from the working groups

10:20



COFFEE BREAK

11:00



Conclusions and Recommendations  
Mrs J. Morgan and Mr P. Croüail, EAN

12:00

END OF THE WORKSHOP

# the working groups

# working group n°1

room: *to be decided*

Can the ALARA principle be fully apply in Emergency Exposure Situations for members of the public?

- Are their steps of ALARA process that cannot apply? Or should apply differently? How differently?
- When and how to evacuate?
- What about other protective actions?
- What does *Reasonable* means anyway?
- ...



## participants

First name	Last name	Affiliation
Viktor	Averyn	Gomel State University Skaryna
Avraham	Ben Shlomo	IAEC
Zhanat	Carr	World Health Organization
Michael	Dauke	AGES GmbH
Panayotov	Dobromir	Fusion for Energy F4E
Mario José	Madruga	IST
Wataru	Naito	National Institute of Advanced Industrial Science and Technology AIST
Anne	Nisbet	Public Health England
Carol	Robinson	International Atomic Energy Agency
François	Rollinger	French Institute of Radiation Protection and Nuclear Safety
Thierry	Schneider	Nuclear Protection Evaluation Center (CEPN)
Shogo	Takahara	Japan Atomic Energy Agency
Catrinel	Turcanu	Belgian Nuclear Research Centre SCK•CEN
Pedro	Vaz	IST

# working group n°2

room: *to be decided*

Can the ALARA principle be fully apply in Emergency Exposure Situations for the occupational exposed individuals?

- Are their steps of ALARA that cannot apply? Or should apply differently? How differently?
- Low dose for many or high dose for a few?
- How do you know that doses are ALARA?
- Can innovative technologies be of use? Pros and cons?
- ...



## participants

First name	Last name	Affiliation
Sylvain	Andresz	Nuclear Protection Evaluation Center (CEPN)
Jarmila	Bohunova	VUJE, Inc.
Sharon	Ely	Public Health England (PHE)
Beatriz	Gomez-Arguello	TECNATOM
Takahiko	Kono	Japan Health Physics Society
Mario José	Madruga	IST
Benedikt	Martens	SCK•CEN
Ciara	McMahon	Irish Environmental Protection Agency
Mário	Reis	IST
Christophe	Murith	Swiss Federal Office of Public Health
Jukka	Sovijärvi	STUK
Pedro	Teles	IST
Chowunchun	Valentin	International Atomic Energy Agency
Fernand	Vermeersch	SCK•CEN

# working group n°3a

room: *to be decided*

Predict the unpredictable. How to ensure the emergency plans are optimal from a radiation protection point of view?

- The challenges raised by ALARA in planning vs. ALARA in real situation (thinking about the history of nuclear accident).
- Acting in emergency
- How to react if the situation goes beyond the prediction?
- ...



## participants

First name	Last name	Affiliation
Michael	Abend	Bundeswehr Institute of Radiobiology
Mariana	Baptista	IST
Thomas	Charnock	Public Health England
José	Díaz	University of Valencia
Tatiana	Duranova	VUJE, Inc.
Iveta	Holánová	Radioactive Waste Repository Authority SÚRAO
Jean-Francois	Lecomte	French Institute of Radiation Protection and Nuclear Safety
Octavia	Monteiro Gil	IST
Catherine	Organo	EPA Ireland
Tamas	Pazmandi	MTA EK
Jan	Pehrsson	PDC-ARGOS ApS
Luis	Portugal	Portuguese Environment Agency
Wolfgang	Raskob	Karlsruhe Institute of Technology KIT
Claude	Souprayen	FLUIDYN France

# working group n°3b

room: *to be decided*

**Predict the unpredictable. How to ensure the emergency plans are optimal from a radiation protection point of view?**

- The challenges raised by ALARA in planning vs. ALARA in real situation (thinking about the history of nuclear accident).
- Acting in emergency
- How to react if the situation goes beyond the prediction?
- ...



## participants

First name	Last name	Affiliation
Valerie	Alderson	ONR
Moshe	Ben-David	IAEC
Eduardo	Gallego	Universidad Politecnica de Madrid - UPM
Florian	Gering	BfS
Alfred	Hefner	Seibersdorf Labor GmbH
Valentine	Leurent	EDF
Joao	Oliveira Martins	Portuguese Environment Agency
Isabel	Paiva	IST
Bharat	Patel	European Commission
Adi	Shay	IAEC
Nathalie	Tchilian	French Nuclear Safety Authority
Alan	Tkaczyk	University of Tartu
Rainer	Wenke	GRS GmbH

the participants



Last name	First name	Affiliation	Country	email
Abend	Michael	Bundeswehr Institute of Radiobiology	Germany	michaelabend@bundeswehr.org
Alderson	Valerie	ONR	United Kingdom	val.alderson@onr.gov.uk
Andresz	Sylvain	CEPN	France	sylvain.andresz@cepn.asso.fr
Averyn	Viktor	Gomel State University Skaryna	Belarus	averinvs@mail.ru
Baptista	Mariana	CNT	Portugal	marianabaptista@ctn.tecnico.ulisboa.pt
Ben David	Moshe	IAEC	Israel	bendavid.conf@gmail.com
Ben Shlomo	Avraham	IAEC	Israel	avibenshlomo@gmail.com
Bohunova	Jarmila	VUJE	Slovak Republic	jarmila.bohunova@vuje.sk
Carr	Zhanat	WHO	Switzerland	carrz@who.int
Charnock	Thomas	PHE	United Kingdom	tom.charnock@phe.gov.uk
Crouail	Pascal	CEPN	France	pascal.crouail@cepn.asso.fr
Dauke	Michael	AGES GmbH	Austria	michael.dauke@ages.at
Diaz	Jose	University of Valencia	Spain	jose.diaz@uv.es
Duranova	Tatiana	VUJE	Slovak Republic	tatiana.duranova@vuje.sk
Ely	Sharon	PHE	United Kingdom	sharon.ely@phe.gov.uk
Eymond	Pierre-Michel	EDF	France	pierre-michel.eymond@edf.fr
Gallego	Eduardo	Universidad Politecnica de Madrid - UPM	Spain	eduardo.gallego@upm.es
Gering	Florian	BfS	Germany	fgering@bfs.de
Gomez-Arguello	Beatriz	Tecnatom	Spain	bgomez@tecnatom.es
Hefner	Alfred	Seibersdorf Laboratories	Austria	alfred.hefner@s-l.at
Holánová	Iveta	Radioactive Waste Repository Authority SÚRAO	Czech Republic	holanova@surao.cz
Lecomte	Jean-François	IRSN	France	Jean-françois.lecomte@irsn.fr
Leurent	Valentine	EDF - SEPTEN	France	valentine.leurent@edf.fr
Madruga	Maria Jose	CNT	Portugal	madruga@ctn.tecnico.ulisboa.pt
Martens	Benedikt	SCK-CEN	Belgium	bmartens@sckcen.be
Martins	Joao	APA	Portugal	joao.martins@apambiente.pt
McMahon	Ciara	EPA Ireland	Ireland	c.mcmahon@epa.ie
Monteiro	Octávia	IST	Portugal	ogil@@ctn.tecnico.ulisboa.pt

Gil Morgan	Julie	Public Health England	United Kingdom	julie.morgan@phe.gov.uk
Murith Naito	Christophe Wataru	FOPH National Institute of Advanced Industrial Science and Technology AIST	Switzerland Japan	christophe.murith@bag.admin.ch w-naito@aist.go.jp
Nisbet	Anne	Public Health England	United Kingdom	anne.nisbet@phe.gov.uk
Organo	Catherine	EPA Ireland	Ireland	c.organo@epa.ie
Paiva	Isabel	CNT	Portugal	ipaiva@ctn.tecnico.ulisboa.pt
Panayotov	Dobromir	Fusion for Energy F4E	Spain	Dobromir.panayotov@f4e.europa.eu
Patel	Bharat	European Commission	Luxembourg	bharat.patel@ec.europa.eu
Pazmandi	Tamas	MTA EK	Hungary	tamas.pazmandi@energia.mta.hu
Pehrsson	Jan	PDC-ARGOS ApS	Denmark	jp@pdc-argos.com
Portugal	Luis	APA	Portugal	luis.portugal@apambiente.pt
Raskob	Wolfgang	Karlsruhe Institute of Technology KIT	Germany	wolfgang.raskob@kit.edu
Reis	Mario	IST	Portugal	mcapucho@ctn.tecnico.ulisboa.pt
Robinson	Carol	IAEA	Austria	c.robinson@iaea.org
Rollinger	François	IRSN	France	francois.rollinger@irsn.fr
Schneider	Thierry	CEPN	France	thierry.schneider@cepn.asso.fr
Shay	Adi	IAEC	Israel	Shayinfo75@gmail.com
Souprayen	Claude	FLUIDYN France	France	claudesouprayen@fluidyn.com
Sovijärvi	Jukka	STUK	Finland	jukka.sovijarvi@stuk.fi
Takahara	Shogo	JAEA	Japan	takahara.shogo@jaea.go.jp
Takahiko	Kono	Japan Health Physics Society	France	takahikorower1@gmail.com
Tchilian	Nathalie	ASN	France	nathalie.tchilian@asn.fr
Teles	Pedro	CNT	Portugal	ppteles@ctn.tecnico.ulisboa.pt
Tkaczyk	Alan	University of Tartu	Estonia	alan@ut.ee
Turcanu	Catrinel	SCK • CEN	Belgium	cturcanu@sckcen.be
Valentin	Chowunchun	IAEA	Austria	c.valentin@iaea.org
Vaz	Pedro	IST	Portugal	pedrovaz@ctn.tecnico.ulisboa.pt
Vermeersch	Fernand	SCK • CEN	Belgium	fvermeer@sckcen.be
Wenke	Rainer	GRS GmbH	Germany	rainer.wenke@grs.de