Importance of Firefighters activities in transboundary Nuclear and Radiological Emergency Preparedness and Response plans

Benjamin Zorko[1,*], Branko Vodenik[1], Boštjan Črnič[1], Matej Lipoglavšek[1], Tilen Brecelj[1], Miha Mihovilovič[1,6,7], Denis Glavič-Cindro[1], Petra Osterman [1], Sandi Gobec[1], Toni Petrovič[1], Diana Marguč[1], Drago Brodnik[1], Thomas Breznik[2], Matjaž Stepišnik[2], Tinkara Bučar[2], Matjaž Koželj[3], Neža Strmole[4], Branko Petrinec[5], Tomislav Meštrović[5]

[1]*Department for low and medium energy physics, Jožef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia*

[2] *Radiation Protection Unit (SVPIS), Jožef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia*

[3] *Milan Čopič Nuclear Training Centre (ICJT), Jožef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia*

[4] *Fire-Fighting Association of Slovenia, Tržaška cesta 221, 1000 Ljubljana, Slovenia*

[5] *Institute for Medical Research and Occupational Health, Ksaverska cesta 2, p.p. 291, HR-10001 Zagreb, Croatia*

[6] *Faculty of Mathematics and Physics, University of Ljubljana, Jadranska cesta 19, 1000 Ljubljana, Slovenia*

[7] *Institut für Kernphysik, Johannes-Gutemberg Universität, J.-J.-Beciter-Weg 45, 55128 Mainz, Germany*

*e-mail: benjamin.zorko@ijs.si

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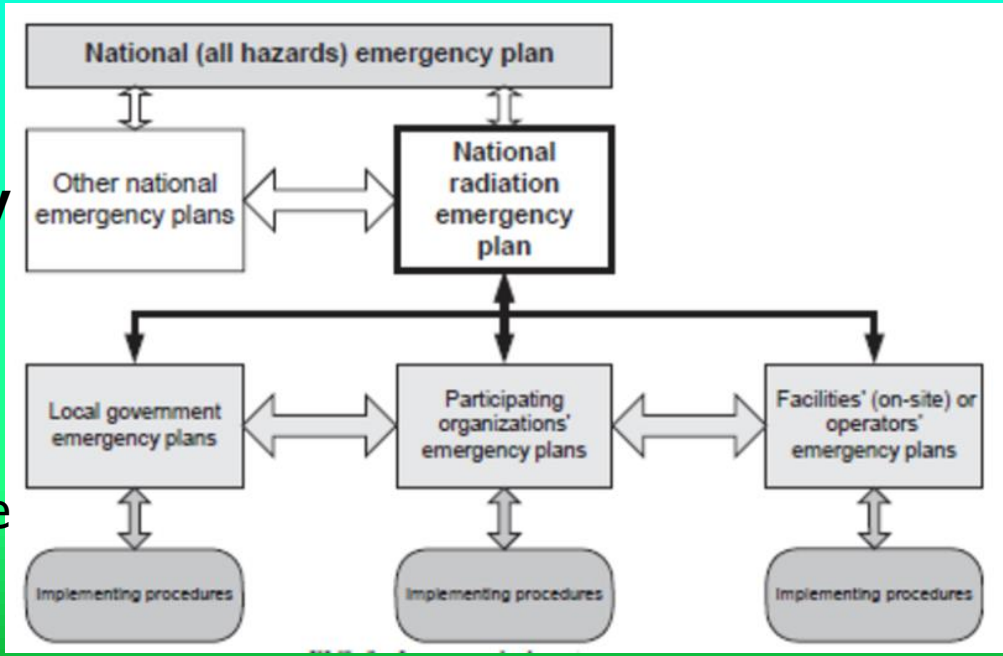
Introduction

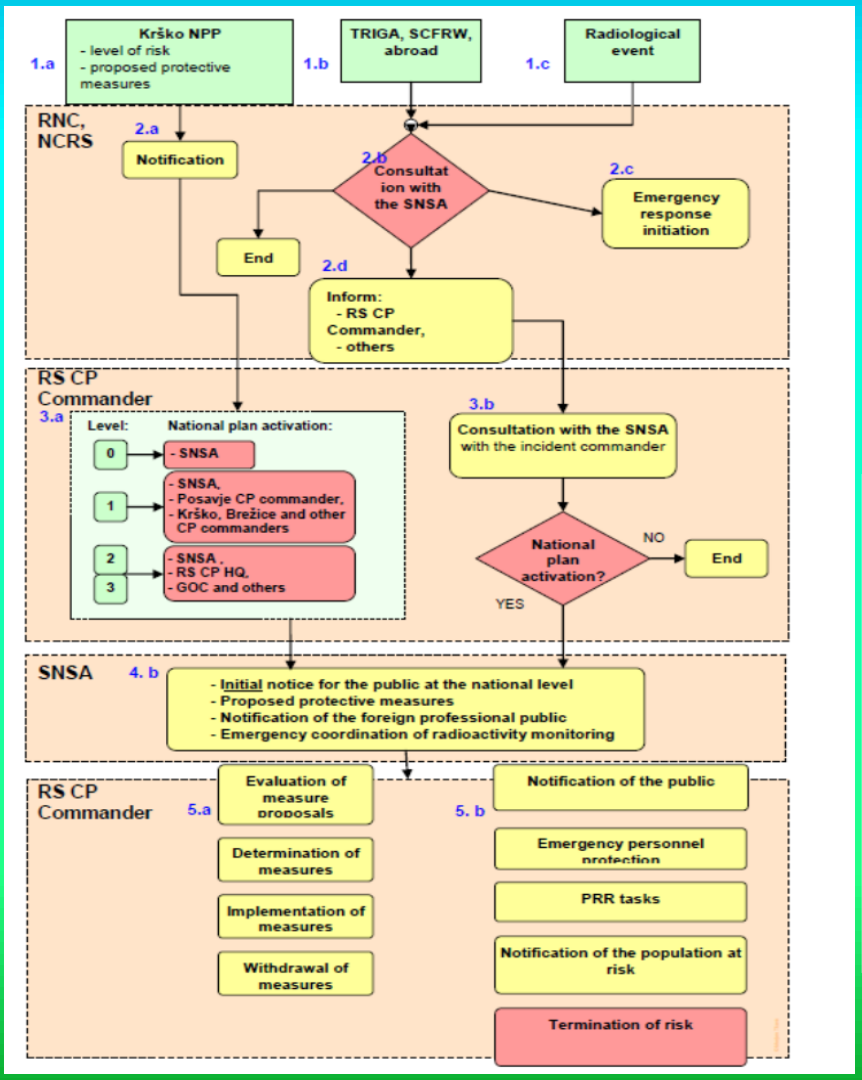
- In nuclear accident or radiological emergency the radioactive material is emitted and dispersed into the environment following characteristic transfer pathways.
- The protection and rescue measures to be deployed in such an event are laid down in **national emergency preparedness and response** (EPR) plans.
- The planning and preparations for response to a nuclear or radiological emergency should be **integrated with the planning for response to hazards of all types and should fully involve the national (and beyond) or local organizations responsible** for response to **conventional emergencies** such as those due to fires, floods, earthquakes, tsunamis or storms. Since an emergency may involve criminal activity such as terrorism or theft, preparations should also involve law enforcement agencies



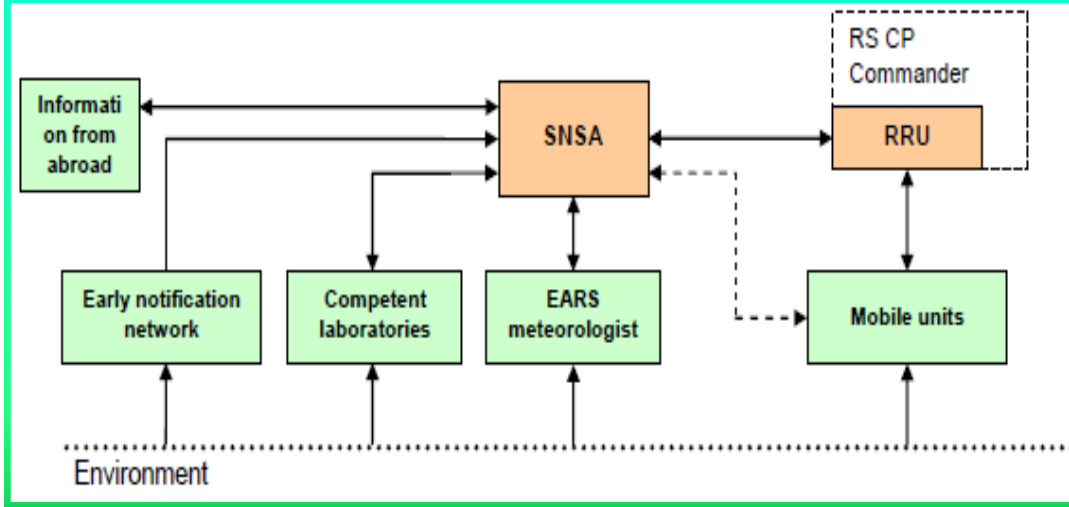
Introduction

- The National Emergency Response Plan for Nuclear and Radiological Accidents is **designed for** the event of an accident which would result in a **major release** of radioactive substances into the environment or the irradiation of people, specifically for the event of:
  - a nuclear accident
  - **a radiological accident**
  - an accident abroad
- When the plume spreads across the border of neighboring countries (**transboundary aspect**) the **EPR measures** gain higher challenge, especially with respect to coordination and harmonization of the activities, as well as the logistical issue.

Introduction



For example: The **National Emergency Response Plan for Nuclear and Radiological Accidents** which was prepared by the *Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR) of the Ministry of Defence (MoD)*



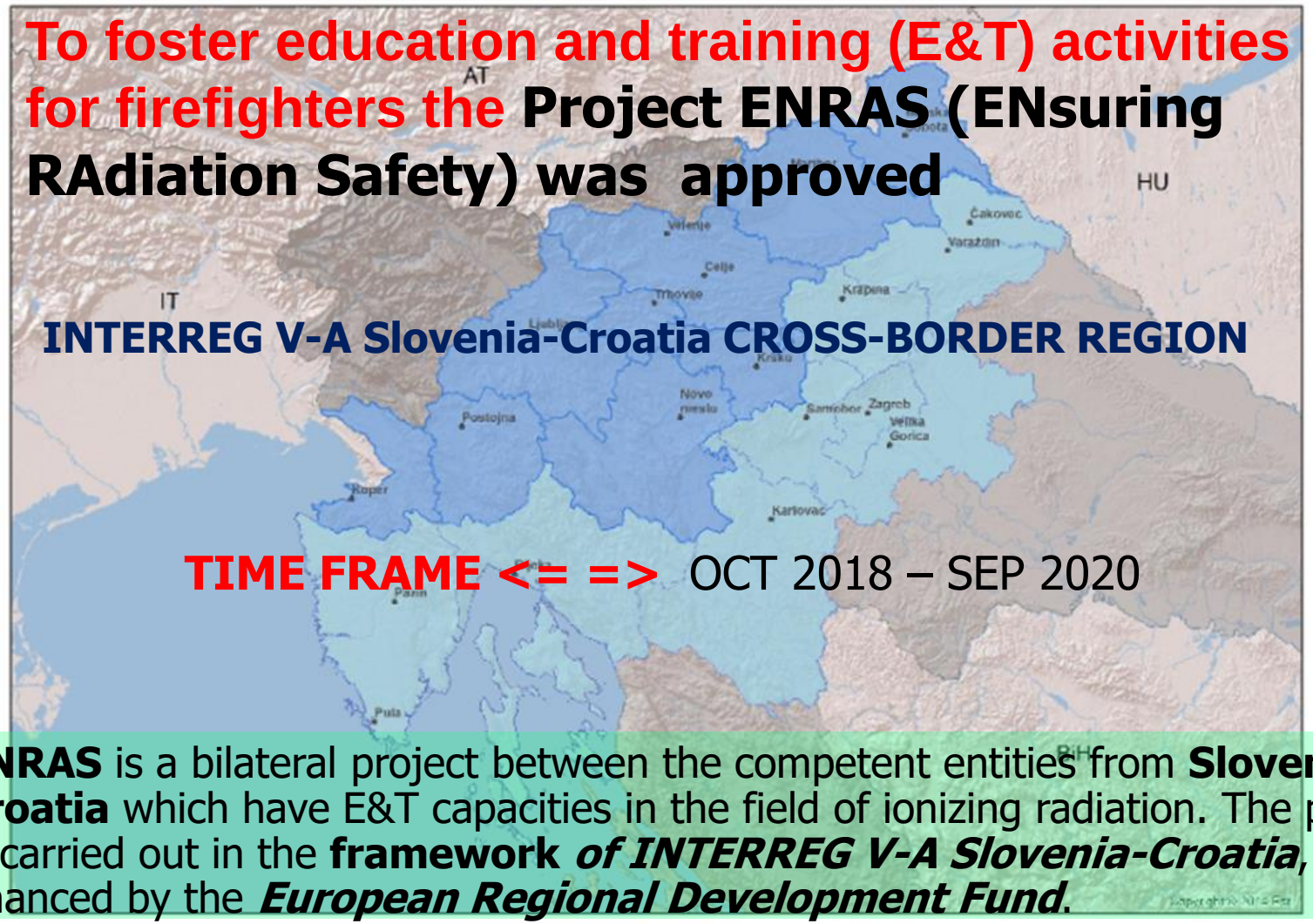
Introduction

In conventional emergencies (fire, floods, traffic accidents, earthquakes, …) the **firefighters** are the first at the scene. Even in the case of nuclear or radiological emergency, it will be no different. To be able to respond properly in different situations, they have to be correctly **educated, trained, drilled and equipped**.

source: feuerwehr-alfeld.de

Introduction

To foster education and training (E&T) activities for firefighters the Project ENRAS (ENsuring RAdiation Safety) was approved



INTERREG V-A Slovenia-Croatia CROSS-BORDER REGION

TIME FRAME <= => OCT 2018 – SEP 2020

ENRAS is a bilateral project between the competent entities from **Slovenia** and **Croatia** which have E&T capacities in the field of ionizing radiation. The project is carried out in the **framework *of INTERREG V-A Slovenia-Croatia***, and financed by the ***European Regional Development Fund***.

Introduction

RELATION WITH NERIS SRA

- **Research area 1.** Challenges in radiological impact assessment during all phases of nuclear and radiological events
  - Key topic 2. Improved monitoring
- **Research area 2.** Challenges in countermeasures and countermeasure strategies in emergency & recovery, decision support & disaster informatics
  - Key topic 4. Countermeasures and countermeasure strategies
- **Research area 3.** Challenges in setting-up a trans-disciplinary and inclusive framework for preparedness for emergency response and recovery
  - Key topic 9. Integrated emergency management –non-radiological aspects (health surveillance, ethical aspects, economic issues, etc.)

ENRAS

PARTNERS

- Jozef Stefan Institute (SLO) – leading partner
- Institute for Medical Research and Occupational Health (CRO)
- Slovenian Firefighters Association (SLO)
- Croatian Firefighters Association (CRO)
- Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR) (SLO)
- Slovenian Nuclear Safety Administration (SLO)
- State Office for Radiological and Nuclear Safety in Croatia (CRO)

Jožef Stefan Institute
Ljubljana
Slovenia

ENRAS

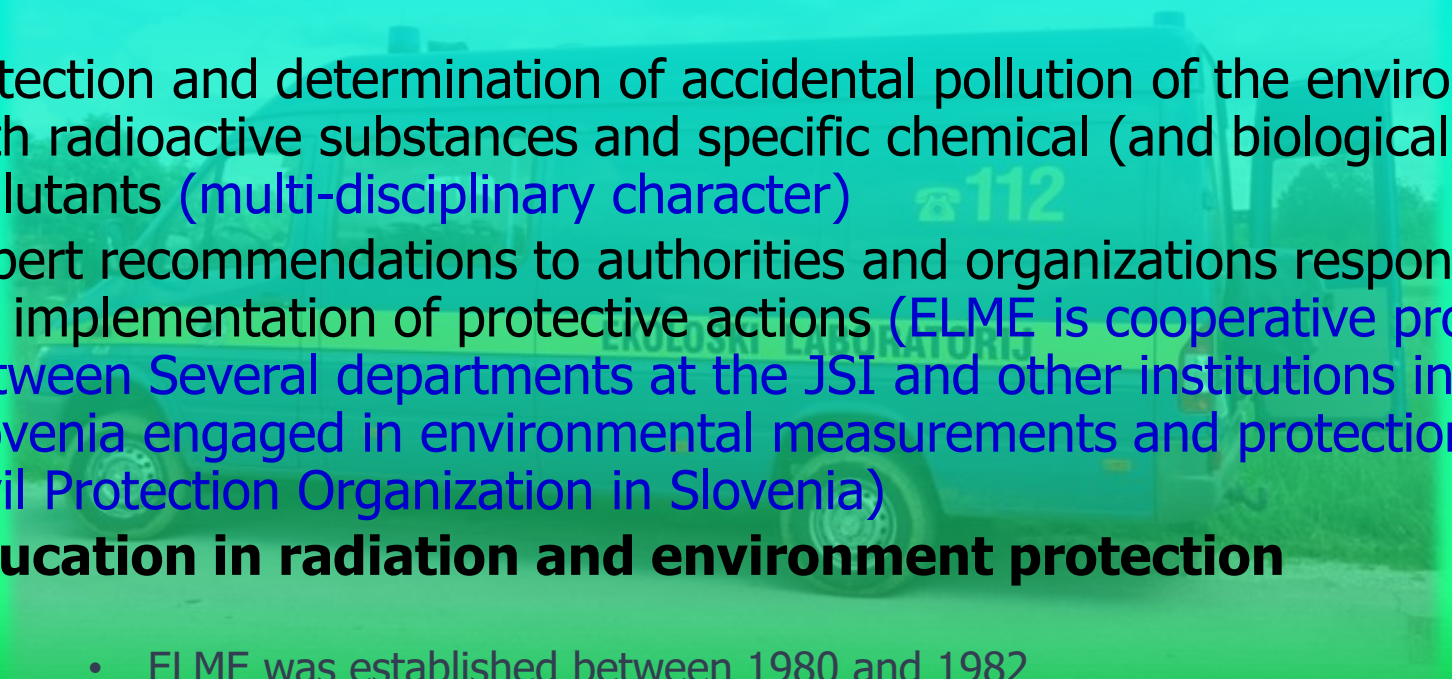
Interreg
SLOVENIA – CROATIA
European Union | European Regional Development Fund

Stockholm 14-18.10.2019 ERPW 2019

ENRAS

MOTIVATION (proposal submission)

- Lessons learnt from major events, accidents, disasters, etc. in the past
- To promote the role of ELME (Ecological Laboratory with a Mobile Unit) in EPR
  - Detection and determination of accidental pollution of the environment with radioactive substances and specific chemical (and biological) pollutants (multi-disciplinary character)
  - Expert recommendations to authorities and organizations responsible for implementation of protective actions (ELME is cooperative project between Several departments at the JSI and other institutions in Slovenia engaged in environmental measurements and protection and Civil Protection Organization in Slovenia)
  - **Education in radiation and environment protection**



- ELME was established between 1980 and 1982
- ELME is the main expert unit in Slovenia for CBRN emergencies

ENRAS

MISSION (GOALS)

The project ENRAS was designed to:

- implement a new system of training for First Responder Teams (firefighters) **for safe intervention in accidents involving the risk of ionizing radiation**
- to sign an agreement on the establishment of a **new cross-border structure** that will promote and coordinate **cross-border cooperation** after completion of the project in the field of safety in accidents involving ionizing radiation
- to develop guidelines for **permanent sustainability** of the skills of the intervention workers in the field of radiation safety
- to **prepare recommendations for appropriate equipment for intervention units** in the region.

ENRAS

The project consists of 4 WP:

- Management
- Education, training and exercise
- Cross-border structure
- Communication

Education, training and exercises

- **INDIVIDUAL TRAINING (60: 30 in Slovenia + 30 in Croatia)**
  - THEORETICAL PART
  - PRACTICAL PART
- **JOINT EXERCISES (8: 4 in Slovenia + 4 in Croatia)**
  - 3 SCENARIOS
- **FINAL EXERCISE (1: border region)**

ENRAS

INDIVIDUAL TRAINING (30 + 30)

- ***THEORETICAL PART-learning objectives***
  - Basics of ionising radiation
  - Detection of ionizing radiation
  - Operational quantities (dose rate, dose, contamination)
  - Protection measures
  - Operational Intervention Levels
  - Typical situations where firefighters might encounter radioactive sources
- ***PRACTICAL PART-learning objectives***
  - Individual training how to handle the equipment which is used by First Responder Teams (FF):
    - to understand the reading of the instruments
    - to be able to asses the severity of the situation
    - to select proper response tactics
  - Working in groups of 4 trainees → 12 trainees per individual training

Education, training and exercises

INDIVIDUAL TRAINING: Equipment of Slovenian Fire-fighter units – GEŠP

PDS 100 GN/ID

Detection
Detector gamma CsI(Tl) 400 cps per µSv/h for ^{137}Cs
Gamma dose rate display 0.01 µSv/h to 100 µSv/h

Spectrometry and Identification
512 / 1024 channels spectra
30keV to 1.7 MeV

ChemPro 100i

Radiation Detector Module
Gamma and X-ray radiation
Dose rate
0.04 µSv/h to 100 mSv/h
Energy range
50 keV to 1.3 MeV
Response time
2,5 seconds (fast mode)
3 min (ambient dose rate)

Education, training and exercises

INDIVIDUAL TRAINING

- **Exercise 1**: Optimization

Learning objectives

- Basic usage of handheld Dose Rate Meters
- Understanding dose calculation
- Understanding optimization by measuring at different distances and using shielding
- Communication of the results

Education, training and exercises

INDIVIDUAL TRAINING

- **Exercise 2:** Contamination measurements

Learning objectives

- Contamination measurements
- Difference between Dose Rate Meters and Contamination Monitors
- Communication of the results

Education, training and exercises

INDIVIDUAL TRAINING

- **Exercise 3:** Radiological assessment

Learning objectives

- Assessment of the radiological situation on the ground due to an unknown source (simulation)
- Proper communication

Joint exercises

- **3 comprehensive scenarios** – complementary to *indivudual training programme* **(among threats identified by NERIS)**
  1) **traffic accident of a cargo vehicle transporting radioactive material**
  2) **mitigation of a spilled radioactive material**
  3) **fire at industrial installation where a radiographic instrument is used**
- The goal of joint exercises is to check the **acquired knowledge of FF** and provide information how to improve individual training programme and other related activities

- Participants; 6 – 8 units (half from Slovenia and half from Croatia)
  - the rules of firefighter`tactics have to be respected
  - knowledge acquired at individual training to be demonstrated
- radiological assessment experts and firefighters`instructors are present to evaluate and assess the performance

Joint exercises

1) traffic accident of a cargo vehicle transporting radioactive material

Čakovec, Croatia, 1st joint exercise, 12th June 2019

Training Centre Ig, Slovenia, 2nd joint exercise, 14th September 2019

Training Centre Ig, Slovenia, 3rd joint exercise, 12th October 2019

Joint exercises

2) mitigation of a spilled radioactive material

Čakovec, Croatia, 1st joint exercise, 12th June 2019

Reactor Site JSI, Slovenia, rehearsal for the joint exercise, 29th August 2019

Training Centre Ig, Slovenia, 3rd joint exercise, 12th October 2019

Joint exercises

3) fire at industrial installation where a radiographic instrument is used

Čakovec, Croatia, 1st joint exercise, 12th June 2019

Training Centre Ig, Slovenia, 2nd joint exercise, 14th September 2019

Training Centre Ig, Slovenia, 3rd joint exercise, 12th October 2019

Achievements, evaluation & analysis

The adequacy of nuclear and radiological emergency **response arrangements** for firefighters is being **evaluated and assessed** through the process **from the individual trainings to joint exercises** representing comprehensive firefighters scenarios involving ionizing radiation.

Achievements, evaluation & analysis

Achievements

- 16 (32) Firefighting (FF) units in Slovenia and Croatia **were trained so far**
- **3 joint exercises were carried out**
- Overal **assessment & analysis** is performed after each
  - Individual training (written exams, feedback surveys, discussions, …)
  - Scenario at the joint exercise (instructors, …)
- **Findings from assessment & analysis** are worked out at meetings of **MB and expert group**
  - To follow the progress of learning programme (E&T)
  - To adapt the learning subjects, etc.
- Communication
  - Press releases
  - Web-site
  - Other
- **Project activities are on track**

Achievements, evaluation & analysis

Preliminary findings from assessment & analysis

- Firefighters are very diligent and motivated in the individual trainings and exercises
- At joint exercises, firefighters show that they have acquired knowledge in individual trainings and they are able to use them in everyday situations
- Reporting proper values /units is still a challenge
- Language at joint exercises is not an obstacle
- Instructors shall stress and encourage trainees to use personal dosemeters
- firefighters' awareness of radioactive contamination is also to be challenged
  - their focus is on their routine conventional emergencies (fires, flooding traffic accidents, etc)
- Cross-border structure is under development

Achievements, evaluation & analysis

- Results of survey – feedback from firefighters

Achievements, evaluation & analysis

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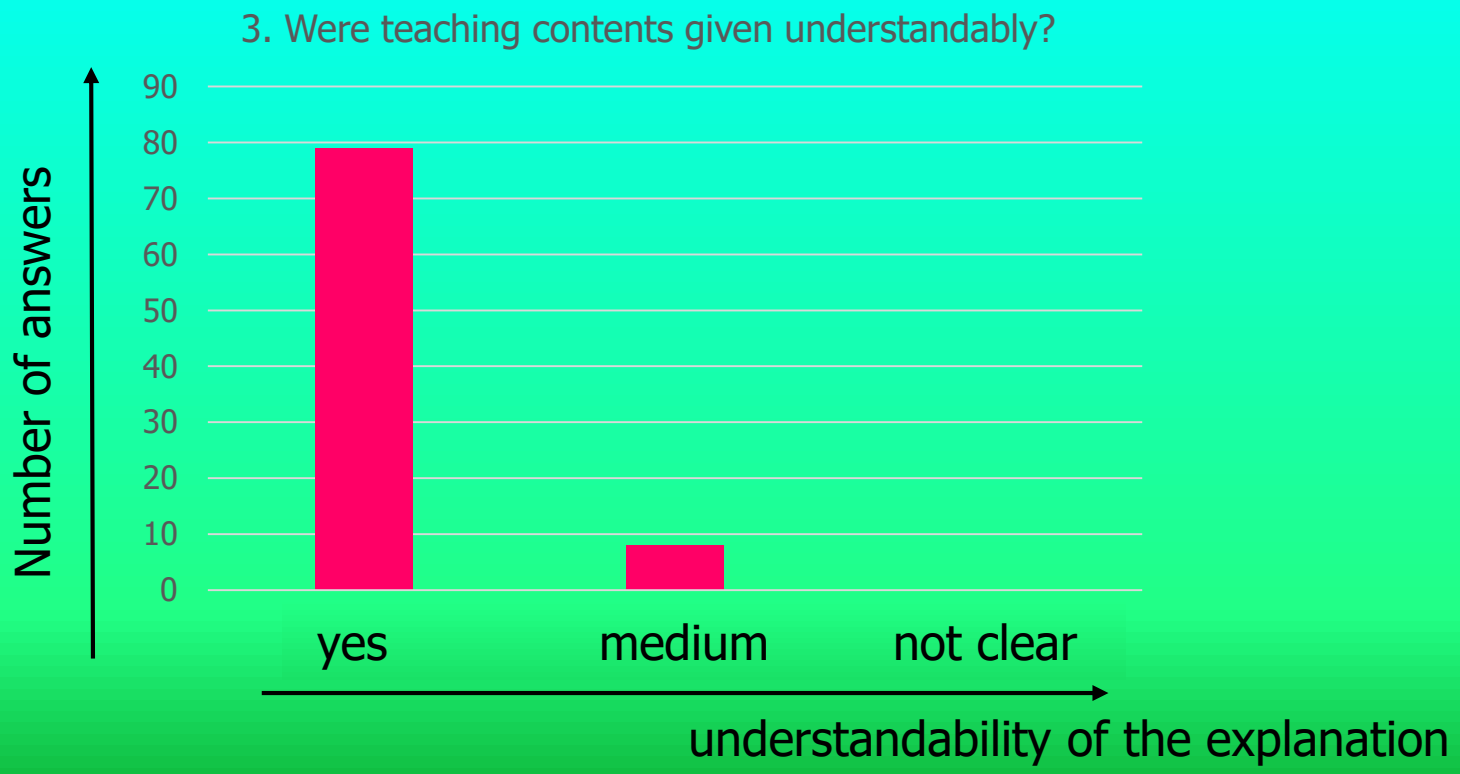
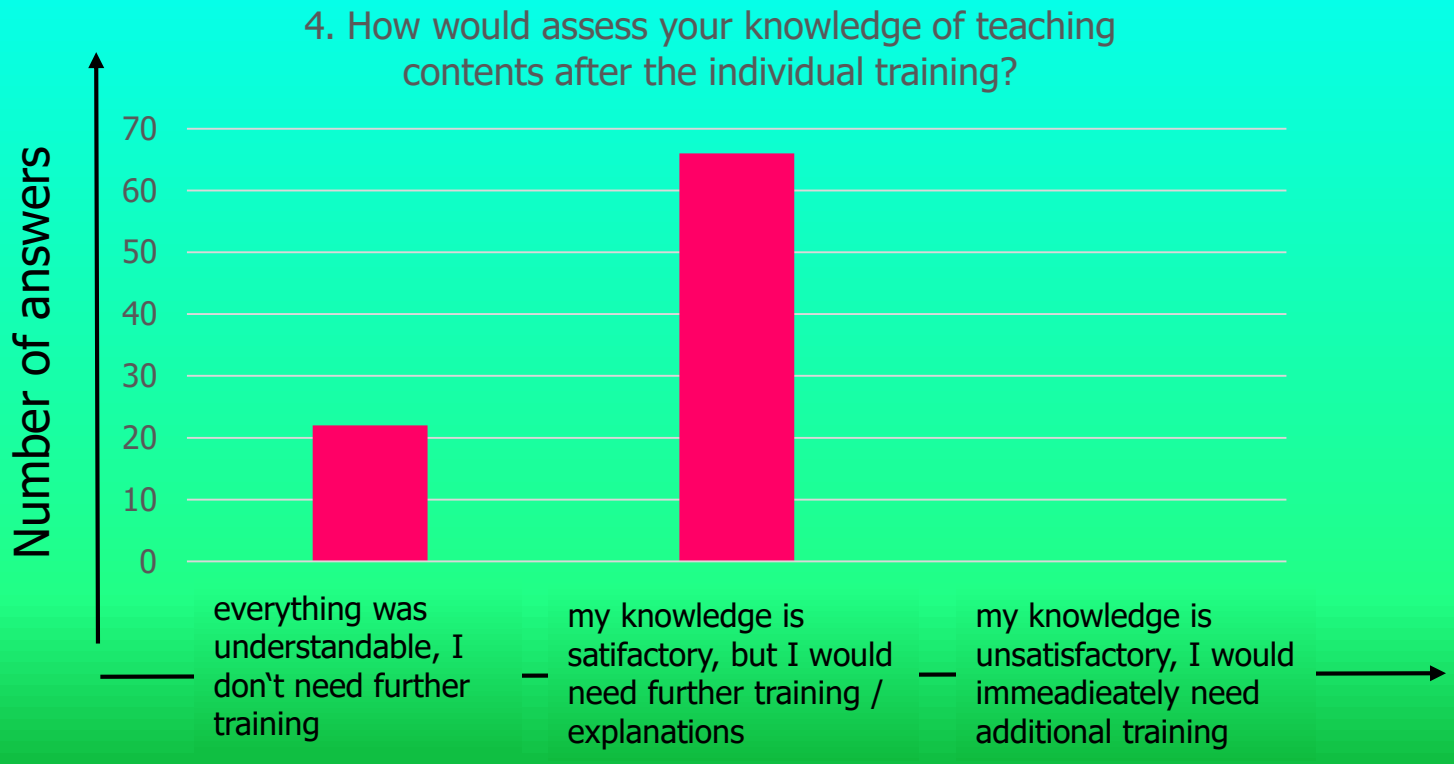
Achievements, evaluation & analysis

- Results of survey – feedback from firefighters



Achievements, evaluation & analysis

- Results of survey – feedback from firefighters



Achievements, evaluation & analysis

- Results of survey – feedback from firefighters

Summary

- **Individual training programme and scenarios for joint exercises** for first responders (firefighters) were **developed** and **put into practice**
- **>32 FF units** (GEŠP) (300 + FF) in cross-border region have already **completed their individual trainings** and **the trainers** from those units have also **participated in joint exercises**
- **3 joint exercises** in cross-border region have already been **performed**
- **the positive and valuable experiences of our work (supported by findings, feedbacks, etc.) so far obliges us to insist on continuing the work program we have started and outlined**
- We are building and strenghtening the trust between
  - institutions and society
  - professionals and community
- **firefighters have a special place in people's hearts and minds!**

THANK YOU FOR YOUR ATTENTION!

Čakovec, Croatia, 1st joint exercise, 12th June 2019

Training Centre Ig, Slovenia, 3rd joint exercise, 12th October 2019