ENRAS

Ensuring Radiation Safety for First Responder Teams in Case of Nuclear or Radiological Accidents

SI-HR

Interreg

SLOVENIA – CROATIA

European Union | European Regional Development Fund

ENRAS

Interreg SLOVENIA – CROATIA
European Union | European Regional Development Fund

ENRAS

ENsuring RAdiation Safety
for First Responder Teams in Case of Nuclear or Radiological Accident

NERIS Workshop 2019

Outline

Justifying the need for the project
Formal framework
Goals
Objectives
Methods
Impact
After the project

Justifying the need for the project

- **Major RADIOLOGICAL disaster - GOIANIA**

- **Major NUCLEAR disaster - CHERNOBYL**

Justifying the need for the project

Major RADIOLOGICAL disaster - GOIANIA

Short summary

- **13 Sept. two men tried to disassemble abandoned teletherapy unit containing Cs-137**
- **18 Sept. parts of disassembled unit were sold to scrapeyard together with a damaged capsule**
- **21 Sept. a friend of scrapeyard owner removed some Cs-137 from the capsule and distributed fragments to several people due to attractive blue glow emitted from the fragments**
- **25 Sept. lead and rest of the source were sold to Junkyard II.**
- **28. Sept. Remnants of the rotating assembly and the source assembly were taken to the Vigilancia Sanitaria (Health Monitoring Agency)**
- **29. Sept. Due to symptoms revealed by people, who were in contact, a medical physicist was asked to perform some measurements of the suspecious package at Vigilancia Sanitaria.**

Justifying the need for the project

Major RADIOLOGICAL disaster - GOIANIA

Vigilancia Sanitaria REPRESENTATIVE

Medical Physicist

10:20 W.F. arrived at the Vigilância Sanitária. Having switched on the replacement monitor upon leaving the NUCLEBRAS offices, he was by then convinced that there was a major source of radiation in the vicinity. In the interim Dr. P.M. had become worried enough to call the fire brigade. W.F. arrived just in time to dissuade the fire brigade from their initial intention of picking up the source and throwing it into a river.

FIRE BRIGADE

11:00 W.F. then persuaded the occupants of the Vigilância Sanitária to vacate the premises. The police and fire brigade supervised to prevent anyone from re-entering the building.

Justifying the need for the project

Major NUCLEAR disaster - CHERNOBYL

Firefighters

- **They had no instruments to measure the dose rate**
- **They were kicking away pieces of graphite and radioactive fuel instead of avoiding them as much as possible**
- **They removed their protection clothes instead of putting on additional protection**

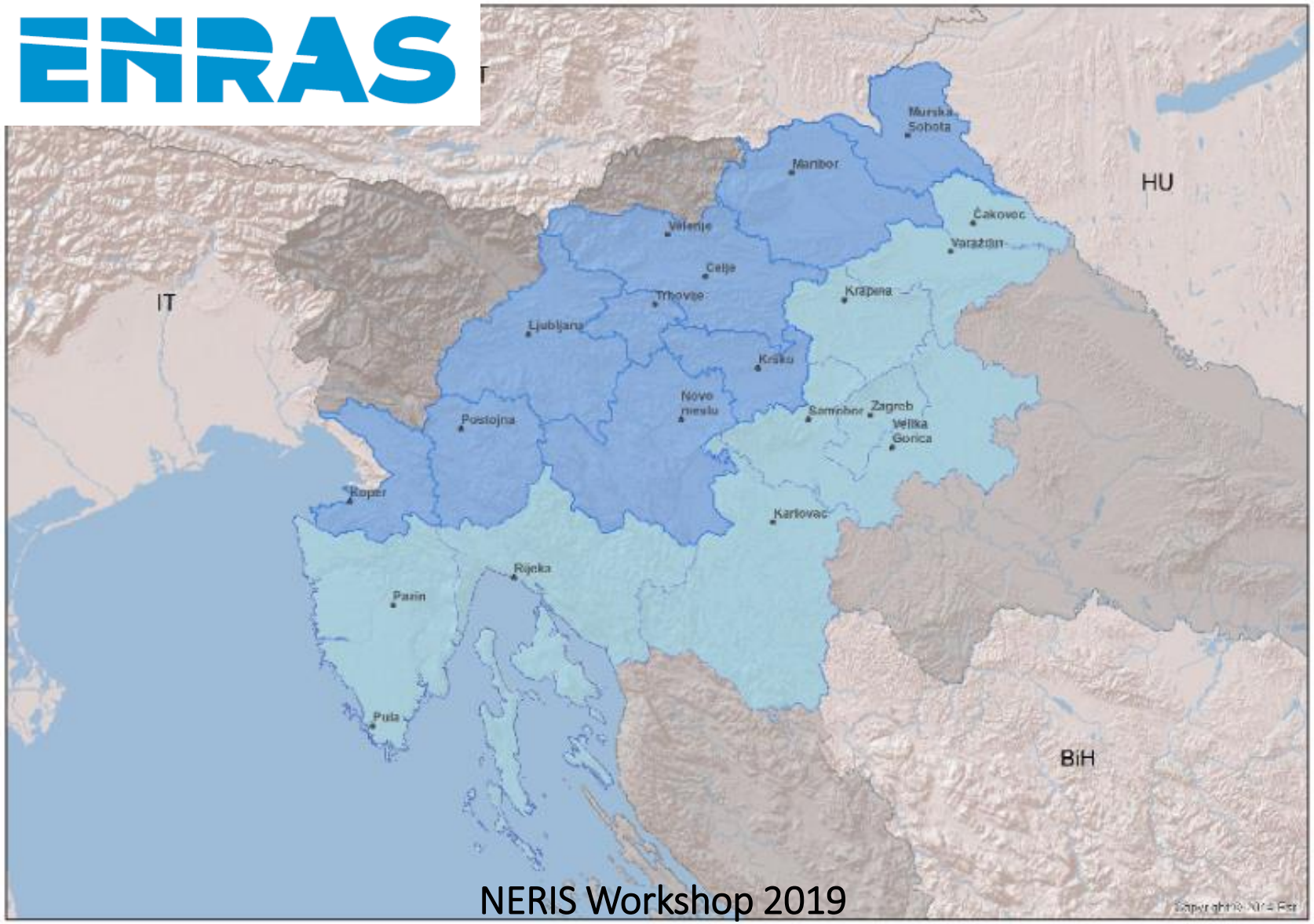
WHAT WAS THE PROBLEM?

- **No one has ever explained to them how to deal with radiation Regarding firefigters**
- **They had little or no understanding how the fire they were fightingwas different from regular fires**

Firefighters = = > FIRST RESPONDERS & FIRST VICTIMS

MONUMENT TO THE LIQUIDATORS AND FIREFIGHTERS

INTERREG V-A Slovenia-Croatia
CROSS-BORDER REGION



NERIS Workshop 2019

ENRAS - GOALS

- To design and implement a new system of training for First Responder Teams (firefighters) for safe intervention in accidents involving the risk of radioactive radiation (OCT 2018 – SEP 2020)

- To sign an agreement on the establishment of a new cross-border structure that will promote and coordinate cross-border cooperation in the field of safety in accidents involving radioactive radiation (OCT 2020 -)

- To develop guidelines for the permanent maintenance of the skills of the intervention workers

- To prepare recommendations for equipping intervention units.

ENRAS - OBJECTIVES

- Select 60 First Responder teams having licence for dealing with hazardous material
- Teach members of each team the necessary basics regarding ionizing radiation
- Train members of first responder teams to routinely use hand held survey meters in order to
  - be able to detect ionizing radiation and
  - assess the severity of the risk
- Qualify them to behave properly with respect to (in case of radiological or nuclear accident)
  - self-protection and
  - protection of the population
- Train and assess their skills in exsercises representing comperhensive scenarios involving ionizing radiation
- Gather experiences gained during eduction to
  - further improve training programme
  - determine the frequency of post project training

INDIVIDUAL UNITS` EDUCATION

THEORETICAL

- Basics of ionising radiation
- Detection of ionizing radiation
- Operational quantities (dose rate, dose, contamination)
- Protection measures
- Operational Intervention Levels
- Typical situations where firefighters might expect radioactive sources

PRACTICAL

- Demonstration of the state of the art equipment
- Training using the equipment posessed by First Responder Teams
  - understanding the reading of the instruments
  - being able to asses the severity of the situation
  - selcting proper response tactics

FIRST RESPONDERS EQUIPMENT

Detection

Detector gamma CsI(Tl) 400 cps per µSv/h for 137Cs
Detector neutron LiI(Eu) (GN version only)
Gamma dose rate display 0.01 µSv/h to 100 µSv/h

Spectrometry and Identification

512 / 1024 channels spectra
30keV to 1.7 MeV

PDS 100 GN/ID

NORM	^{40}K, ^{226}Ra and daughters, ^{232}Th and daughters
Medical	^{18}F, ^{5}Cr, 67Ga, ^{75}Se,^{99}mTc, ^{111}In, ^{123}I,^{131}I,^{201}Tl
Industrial	^{22}Na, ^{57}Co, ^{60}Co, ^{133}Ba, ^{137}Cs, ^{152}Eu, ^{192}Ir, ^{241}Am
SNM	^{235}U, ^{238}U, ^{239}Pu

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)

ChemPro 100i

FIRST RESPONDERS EQUIPMENT

NOT ONLY

TRAIN firefighters using their equipment

BUT ALSO

Try to ESTABLISH whether the equipment is suitable for firefighters` interventions

- waterproof
- easy to stick
- acoustic alarms in order not to look at the screen all the time

AND IF NEEDED

To RECOMMEND ALTERNATIVE equipment

JOINT EXERCISES

JOINT EXERISES

- GOAL => CHECK the acquired knowledge and PROVIDE FURTHER TRAINING
- SELECTION OF UNITS => Units that have completed individual training / do not weaken regional response capability
- NUMBER OF ATTENDEES => 6 – 8 units (half from Slovenia and half from Croatia) with 30 men altogether will be involved.
- REQUIREMENTS =>
  - All the rules of firefighter` tactics have to be respected
  - Knowledege and proper handling due to the danger of radioactive radiation has to be demonstrated

- METHOD => comprehensive fire fighting interventions
- SCENARIOS
  - Accident of a vehicle for radioactive cargo
  - Mediation for spillage of radioactive material
  - Fire during industrial radiography
- ADDITIONALY
  - ELME experts will always be present to evaluate radiological part
  - Firefighters` Instructors will evaluate firfighters tactics

FINAL JOINT EXERCISE

JOINT EXERISES

- GOAL => DEMONSTRATE the acquired knowledge
- SELECTION OF ATTENDEES => 1-2 representatives of EACH UNIT – approximately 120 men will be involved.
- REQUIREMENTS =>
  - All the rules of firefighter` tactics have to be respected
  - Knowledege and proper handling due to the danger of radioactive radiation has to be demonstrated
- METHOD => comprehensive fire fighting interventions
- SCENARIO
  - Accident of a vehicle for radioactive cargo
  - Mediation for spillage of radioactive material
  - Fire during industrial radiography
- ADDITIONALLY
  - PUBLIC EVENT
  - MEDIA
  - COMMENTATOR

YOU ARE INVITED !

IMPACT

- Training program for first responders developed and put into practice
- 60 + intervention units in cross border region qualified for interventions involving radiation
- 700 + individual firefighters involved in training program
- 9 joint exercises in cross border regions performed involving first responders from both countries

LONG-TERM IMPACT

SUSTAINABLE CROSS-BORDER STRUCTURE = FORMAL AGREEMENT BETWEEN THE PARTNERS OF THE PROJECT

- TO PROMOTE CROSS-BORDER COOPERATION IN THE FIELD OF RADIATION SAFETY
- TO MAINTAIN AND FURTHER DEVELOP THE COMPETENCE OF FIRST RESPONDER TEAMS, ACHIEVED DURING THE PROJECT
- TO PROMOTE PERIODIC ACTIVITIES
- TO MAINTAIN WEB-BASED KNOWLEDGE DATA BASE FOR FIRST RESPONDERS
- TO IMPROVE GUIDELINES AND PROTOCOLS (FOR TRAINING AND EQUIPPING INTERVENTION UNITS)
- TO HARMONIZE AND FURTHER DEVELOP INTERVENTION PROCEDURES IN CROSS-BORDER REGION
- TO TRANSFER THE RECOMMENDATIONS REGARDING RADIOLOGICAL EMERGENCY PREPAREDNESS OF FIRST RESPONDERS BASED ON EXISTING PROJECT INTO THE REGULATORY LEGISLATION

BONUS IMPACT OF ENRAS

- BRIDGING THE GAP BETWEEN
  - INSTITUTIONS AND SOCIETY
  - PROFESSIONALS AND COMMUNITY
- VALUABLE EXPERIENCES, GAINED DURING THE PROJECT
- MAY BE TEMPLATE FOR SIMILAR STRUCTURES IN CROSS BORDER REGIONS.

Partners

Institute Jožef Stefan (SLO)

Institute for Medical Research (CRO)

Slovenian Firefighters Association (SLO)

Croatian Firefighters Association (CRO)

Administration of the Republic of Slovenia for civil protection and disaster (SLO)

Slovenian Nuclear Safety Administration (SLO)

State Office for Radiological and Nuclear Safety in Croatia (CRO)

THANK YOU FOR YOUR ATTENTION!