31/8/2021
No 4#

THE INCLUDING PROJECT MARATHON!

PROMOTION OD INNOVATION IN THE MANAGEMENT OF RADIOLOGICAL EMERGENCIES

After the forced postponing of the Joint Actions planned in Bologna (Italy) and Mikkeli (France) in light of the travels ban due to the COVID 19 pandemic, INCLUDING has succeeded to execute on 22nd June 2021 at the Piraeus Port Commercial Terminal in Athens its first Joint Action. It has been a successful exercise organized by the Hellenic Ministry of Defence (HMOD) in collaboration with the Port Authorities and the Greek Atomic Energy Commission. More than 40 observers from abroad, and with high-level representatives of HMOD, assisted in the response to the discovery of an unknown radiological source in a cargo container. It has been the first possibility to implement the INCLUDING vision to promote innovation in the management of radiological emergencies through sharing of resources among stakeholders from different Member States. Moreover, the Joint Action at Piraeus has been also the first setting where to test the added value of the INCLUDING Web based platform for planning and executing a field exercise with mobilization of technological and human resources. The CBRNe Coy centre at Chaidiri, western outskirt of Athens, hosted on 23 June 2021 a vibrant evaluation session led by experts from the Nuclear Security Centre of Excellence (NSCOE) in Lithuania and during which the Piraeus Port exercise has been analysed in light of the evaluation strategy developed by Task5.2 of INCLUDING. On 24th and 25th June 2021, the same location hosted the 2nd INCLUDING annual workshop entirely devoted to innovative aspects in Nuclear Security in Maritime Infrastructure with three different sessions covering the strategic aspects, the operational developments and the status of European collaboration.

SUMMARY OF THE INCLUDING RECENT ACHIEVEMENTS

- *Field exercise at Piraeus Port (Athens)*
- *2nd Annual Workshop in physical presence (Athens)*
- *Report on NATO RN training programs by ISCC*
- *Presentation of INCLUDING evaluation methodology at the "Mechanisms for assessing innovation in crisis management" organized online by Akademia WSB and the Main School of Fire Services (Poland)*
- *Contribution of INCLUDING to the final conference of the H2020 Stair4Secuirty (S4S) project with a presentation on the use of the S4S platform for Nuclear Security.*

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The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 833573.

Nineteen distinguished speakers from nine different countries presented their results and with the much-appreciated participation of the President of the National Authority for Radioprotection and Nuclear Safety and Security of the Republic of Mauritania. The four working days in Athens marked a step stone in the INCLUDING project with the generation of a massive number of results that are actually under elaboration by the several Work Packages involved. Last but not least, the activities took place in the wonderful landscape of the historical city of Athens and with a great hospitality by the local organizers as in the tradition of the Greek culture.

SUMMARY OF THE INCLUDING RECENT ACHIEVEMENTS

- *Presentation of INCLUDING at the final workshop of the H2020 ENCIRCLE project.*
- *Presentation of INCLUDING results at the workshop "DISASTER RISK SOCIETIES – STATE-OF-PLAY AND WAY FORWARD" organized by CERIS (DG-HOME)*

The time is coming now for the INCLUDING Community to move into the North of Europe and precisely in Mikkeli (Finland) for the 2nd INCLUDING Joint Action organized by the South Savo Regional Fire Service from 13th to 16th September 2021. A multi-disciplinary field exercise dealing with Material Out of Regulatory Control and with elements of source localization, environment decontamination and treatment at a hospital of injured and contaminated people. Another test for the INCLUDING Federation to support resource sharing and capacity building in a sensitive domain like Nuclear Security.

To remain in the Olympic mood inspired by Athens and from this Olympic years, the 2021 marathon of events of INCLUDING will be completed by the Joint Action organized in the Saclay centre operated by the French Alternative Energies and Atomic Energy Commission (CEA) from 20th to 22nd October 2021. A training/exercise activity focused on 99Tc, a worldwide used radioisotopes for medical applications.
Among the other activities in these last six months, it is worth to mention the contribution of INCLUDING to the Conference "MECHANISMS FOR ASSESSING INNOVATION IN CRISIS MANAGEMENT", organized by Akademia WSB and the Main School of Fire Services (Poland), with a presentation from Mrs. Dinara Neimontaite (NSCOE) entitled "Evaluation approaches in frames of INCLUDING Project".
In addition, ISCC issued another very useful report, which adds to other previous two, on the training courses on RN from NATO.

Extensive reports of all the executed events and information on next ones are available on the INCLUDING project web site at the link www.including-cluster.eu.

THE 1ST INCLUDING JOINT ACTION AT THE PIRAEUS PORT COMMERCIAL TERMINAL

THE HELLENIC MINISTRY OF DEFENSE HAS ORGANIZED ON 22ND JUNE 2021 A FIELD EXERCISE AT THE PIRAEUS PORT OF ATHENS AND DEALING WITH THE IDENTIFICATION, RECOVERY AND CUSTODY OF AN ORPHAN SOURCE IN A CARGO CONTAINER.

With an ever-increasing number of shipments of radiological sources through maritime routes, commercial ports face more and more the possibility to deal with the Material Out of Regulatory Control (MORC). In light of this, and coherently with the INCLUDING objective to promote training and exercise activities updated with the evolving threats, the Hellenic Ministry of Defence has organized at the Piraeus Port Commercial Terminal an exercise dealing with the identification, recovery and custody of two orphan sources. The exercise has been conducted in a realistic setting and with two 137Cs sources qualified for training made available by the Greek Atomic Energy Commission. The actions carried out included command and control, communications, hazard identification, site security, monitoring and control of contamination, device recovery and packaging, First Responders decontamination.

The added value of the INCLUDING project, with respect the well-established intervention procedures and protocols in force in the Hellenic Republic, has been the integration and test of:

- A quadcopter UAV made available from HMOD (Greece) and with onboard a gamma probe count rate delivered from CEA (France). The assembly was equipped with a Raspberry PI for wireless transmission of the gamma probe reading;

- A UGV provided by NKUA (Greece) where it was installed a source identifier provided by the Greek Atomic Agency Commission and, also in this case, with a Raspberry PI for wireless transmission of acquired data;

- The integration of the Including Web Based Platform (IWBP) with the C2 system of the Command Post in the exercise area. The IWBP allowed for a real time visualization of the technological and human resources mobilized in the incident area and the display of the data acquired by the sensors onboard the AUV and UGV and managed by the intervention teams.

More details on the use of the IWBP in the Piraeus port Joint Action are given in the “Technical corner” section of this newsletter.

Fig. 1. The observers of the Athens JA

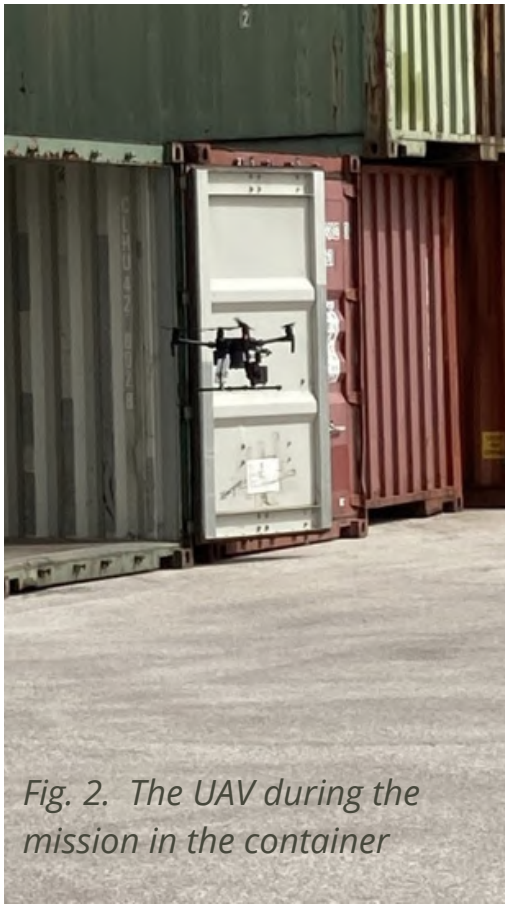


Fig. 2. The UAV during the mission in the container

Fig. 3. The UGV during its inspection in the container

Fig. 4. The decontamination station

As foreseen in the INCLUDING Work-programme, each Joint Action is followed by an evaluation session carried out according to a well-defined evaluation strategy and methodology. Two evaluators from NSCOE (Lithuania) have been collecting data during the exercise as planned in the Event Evaluation Guide (EEG) and pertinent to a plurality of previously established evaluation criteria. The evaluation was discussed during a plenary session held the day after the exercise and where the gathered stakeholders shared knowledge and views building upon the outcomes of the exercise. One of the main outcomes of the evaluation has been a very high score for the integration of the resources provided by the INCLUDING project to the First Responders from the CBRN Coy Centre of the HMOD.

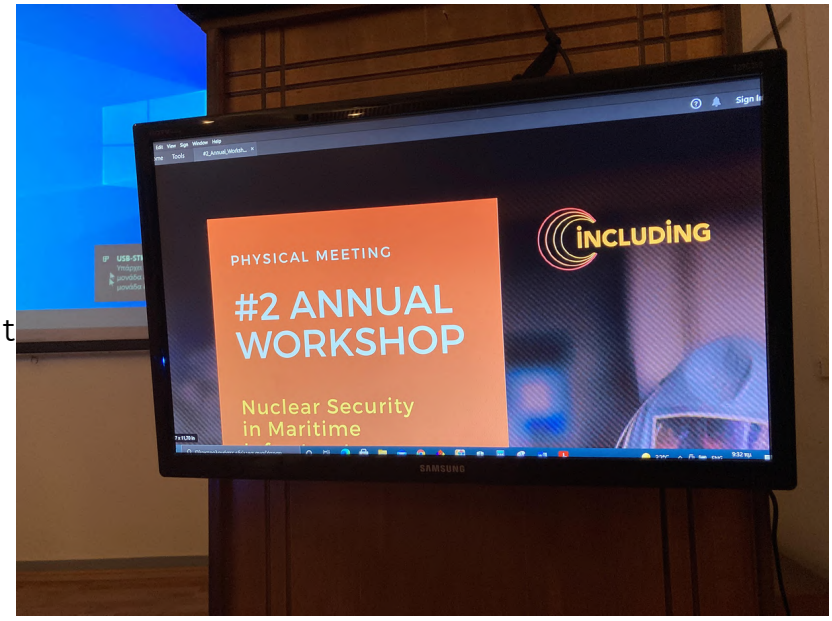
Fig. 5. A moment of the evaluation session

THE 2ND INCLUDING ANNUAL WORKSHOP – CHAIDARI (GREECE), 24/25 JUNE 2021

FOCUSED ON NUCLEAR SECURITY IN MARITIME INFRASTRUCTURE, IT HAS BEEN HELD IN PHYSICAL PRESENCE AND WITH THREE PRESENTATIONS FROM REMOTE.

The Workshop has been hosted by the Joint CBRN Coy centre of the Hellenic Ministry of Defence and organized by the Kapodistrian and National University of Athens and open with a welcome speech from prof. S. Hadjiefthymiades . More than 40 participants from 9 different countries gathered to discuss open issues in nuclear security in maritime infrastructure during three sessions distributed in two working days. The first session, devoted to strategic aspects, started with a much-appreciated presentation from A. Boziari from the Greek Atomic Energy Commission and on cases study in Greece. The session went on with the speeches from Mr. I.M. Moussa, President of the National Agency for Radioprotection and Nuclear Safety and Security of the Republic of Mauritania (ARSN), Mrs. A. Rizzo from ENEA (Italy) on challenges in the chain of custody procedures and of Mr. A. Livsic from NSCOE (Lithuania) on training aspects.

The second session was focused on operational aspects. Prof. S. Hadjiefthymiades (NKUA) described the progresses in the development of a key activity of the project like the realization of the INCLUDING web-based platform. Mr. R. Hedel from Fraunhofer IVI (Germany) talked about Crisis Management Research at his institute and Mr. M. Melo from INESC TEC (Portugal) gave an update on the current status of development of Immersive Virtual Reality tools for training in CBRN.



After a well-deserved lunch break, the participants learnt about civil-military cooperation aspects from Capt. S. Kolovos (HMOD), the use of UAV in maritime infrastructure from Mrs. A. Nadziejko of Tekever (Portugal), of new solution for radiological detectors to be installed onboard UAV from Lt. F. Fumian of the Italian Joint NBC Defence School and Mr. A. Chierici from Tor Vergata University of Rome and on research activities at CAEN (Italy) from Mr. J. Givelotti. The session was concluded with the presentations from Mr. M.M. Mounja (ARSN) on case studies in Mauritania and of Mr. K. Boudergui from CEA (France) on the activities from the H2020 TERRIFIC project.

After having enjoined a relaxing social dinner tasting typical Greek recipes and under the magnificence of the Parthenon, the participants on 25 June 2021 continued to discuss on cooperation with others EU projects and international activities. Mr. K. Bodor from the Hungarian Academy of Sciences Centre for Energy Research MTA EK summarized the excellent results from the C-Bord project on inspection in maritime infrastructure. After, Mrs. R. Brancaleoni from Catholic University of the Sacred Hearth (Italy) presented the EU-Hybnet project (H2020) and its fruitful cooperation with INCLUDING, Mrs. L. Petersen from the International Union of Railways (France) the activities from the H2020 project PROACTIVE and Mr. R. Purves from Riskaware (UK) the ESA project UrbanAware on Information Management System for incident planning, training and response. The two last presentations were from Mr. I. Daniilidis of Kemea (Greece) on the H2020 EXERTER project and from Col A. Zafirakis, Hellenic Army General Hospital (Greece) on medical aspects of CBRN threats.

The two-days workshop was held in a fully collaborative environment with fruitful discussions and dense moments of networking as in the INCLUDING spirit.
The Workshop ended with the distribution to all participants of a plaque kindly offered by HMOD to remember this perfectly organized event.

Fig. 6. The INCLUDING project Coordinator (on right) during an exchange of views with Mr. I.M. Mouusa, President of ARSN (on left)

Fig. 7. R. Brancaleoni during her much appreciated speech

PRESENTATION OF THE JOINT ACTION IN MIKKELI (FINLAND) – 13/16 SEPTEMBER 2021

THE SECOND JOINT ACTION OF THE INCLUDING PROJECT IS A FIELD TECHNICAL EXERCISE THAT WILL TAKE PLACE IN THE FINNISH CITY OF MIKKELI, 200KM NORTH-EAST OF HELSINKI AND ORGANIZED BY THE SOUTH SAVO REGIONAL FIRE SERVICE.

Initially planned in April 2021, the 2nd INCLUDING project Joint Action organized by South Savo Regional Fire Service (SSAV) will take place in in the outskirt of the city of Mikkeli (Finland) from 13th to 16th September 2021. It will be a Field Technical Exercise (FTX) where many agencies will put in place a coordinated response to a R/N incident scenario caused by the stolen and missing of four Caesium-137 sources. In the simulated scenario, various civilians are exposed accidentally to radiation sources with irradiation and contamination. In addition to SSAV, several other local authorities, like the Eastern Savo Police Department, the Emergency Medical Service with the local hospital, Finnish Defence Forces and the Voluntary Rescue Service will be involved in the hazardous situation management. The FTX is organized with the support of Mikkeli Development Miksei Ltd., the City of Mikkeli and the Finnish Radiation and Nuclear Safety Authority (STUK). Much appreciated is the voluntary contribution of Environics and Mirion as technology providers of innovative tools to be deployed and tested during the FTX.

In addition, ENEA (Italy) will deploy a drone equipped with a radiometric sensor for sources search and measurements of the environmental dispersion. In particular, the Mikkeli FTX has the scope to identify areas for improvements in dealing with a radiological emergency on provincial/regional scale. It is focused on testing the capacity of the SSAV and Mikkeli area Testbed to sustain the development of the INCLUDING Federation seen as network of practitioners in the RN sector and aimed at improving resources and knowledge sharing, adoption of best practices and interoperability at EU level. The scenario is tailored on a nuclear security event, like in the IAEA definition, and focused on the detection of Material Out of Regulatory Control (MORC). The FTX will be also the possibility to further test improvements in the INCLUDING web-based platform under development in WP2.

PRESENTATION OF THE JOINT ACTION IN SACLAY (FRANCE) - 20/22 OCTOBER 2021

AREA 500 OF THE CEA RESEARCH CENTRE IN SACLAY (PARIS) WILL HOST THE THIRD JOINT ACTION OF THE INCLUDING PROJECT.

Area 500 is a fully equipped facility inside the CEA research centre of Saclay, 25 Km. South-east from Paris (France), for exercise and training sessions on Radiological and Nuclear emergencies. It will host from 20th to 22nd October 2021 the third Joint Action of INCLUDING and devoted to the identification, recovery and decontamination from 137Cs and 99TC orphan sources. In particular, 99Tc is a radioisotope worldwide used in hospitals for medical diagnostic and one of the few in the liquid phase at atmospheric conditions. On the afternoon of 20th October, the participants will be introduced to the exercise objectives and actions.

Fig. 8. A large view of Area 500 during an exercise

The full morning of 21st October will be covered by the exercise with deployment of equipment and sensors managed by the CEA intervention teams. On the afternoon there will be a hands-on training session where participants will learn more from the CEA experts on the tools used in the morning. On the morning of 23rd October there will be a plenary session with discussions on the activities carried out the day before and with the scope to identify areas of improvements and to build consensus on open aspects. This third Joint Action will have a mixed exercise/training nature, coherently with the INCLUDING project objectives and will mark a further possibility to use the INCLUDING Web based platform for the planning and execution.

Fig. 9. CEA mobile unit for radioprotection

TECHNICAL CORNER: THE INCLUDING WEB BASED PLATFORM AT THE PIRAEUS PORT JOINT ACTION

DELAYED FOR THE COVID 19 IMPACT, THE DEBUT OF THE INCLUDING WEB BASED PLATFORM IN A JOINT ACTION MATERIALIZED ITSELF IN THE PIRAEUS PORT EXERCISE. RESULTS HAVE BEEN IN LINE WITH EXPECTATIONS AND IN SOME ASPECTS, WELL BEYOND.

The INCLUDING Web-based platform is central to our project. The plan is to bring to a next level the concept initially developed in the H2020 project RAWFIE (Road, Air and Water based Future Internet Experimentation). In fact, the resource abstraction, which in the case of RAWFIE covers robotic devices and their onboard sensors, in INCLUDING will be extended to include human resources (i.e., groups or individuals with specific expertise), equipment required for the RN operations and software components (e.g., simulators, serious games, immersive VR). Therefore, the testbed itself is a managed resource, which, in turn, is a collection of other resources (robots and other machinery, sensors, humans, software). All these resources are modelled at the system level in order to accurately designate in space and time their reservation, use and release as a set of hierarchically structured assets. The INCLUDING Web-based platform functionalities will be demonstrated during the project Joint Actions.

INCLUDING Web based platform (IWBP) was used in several stages of the Piraeus Port Joint Action. The first step was through the IWBP Booking Tool, in which the Joint Action organizers selected the testbed, the fixed infrastructure from the testbed the mobile resources, also from other testbeds, and human actors to be deployed in the exercise. Specifically, in the Piraeus Port Joint Action, the organizers selected the unmanned vehicles, the sensors and the intervention teams from HMOD, NKUA and CEA testbeds. It must be outlined that the resources to be mobilized are physically located in the Haidari centre of HMOD that is nearly 7 km away from the Piraeus port where the Joint Action took place.

TECHNICAL CORNER: THE INCLUDING WEB BASED PLATFORM AT THE PIRAEUS PORT JOINT ACTION

In the successive phase, the exercise organizers created the scripts in the IWBP Drill Authoring Tool (DAT) and starting from the scenario of the Joint Action created by HMOD in collaboration with WP3, WP4 and WP5 of INCLUDNG. The DAT gave the exercise organizers the opportunity to insert, process and execute the desired sequence of actions before their practical execution. With DAT, the Joint Action organizers created, prior to the Piraeus Port exercise real execution, a simulation of the trajectories of UAVs and UGVs, the activation of the sensors in order to retrieve in real time the measurements and the trajectories of the operators on field combined with assigned tasks. This capability offered by IWBP is central for the training and experimentation dimension of the INCLUDING Joint Action. In fact, once defined the reference scenario and the operational setting, the Incident Commander or whoever in charge to study the management of the emergency, may simulate the evolution of the actions to solve the situation and bring back the area to normal operative conditions. They may assess strengths and weaknesses of a chosen line of intervention and decide for the best strategy to adopt when the drills will be practically executed.

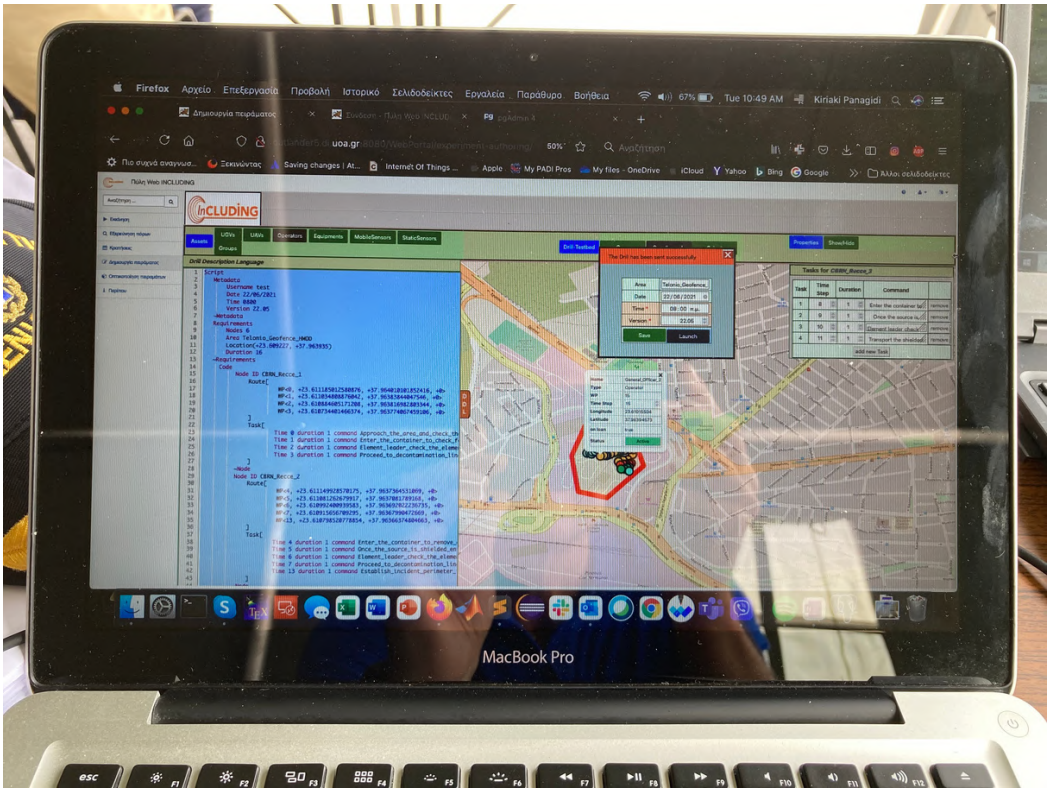


Fig. 10. The IWBP during the JA in Piraeus port

TECHNICAL CORNER: THE INCLUDING WEB BASED PLATFORM AT THE PIRAEUS PORT JOINT ACTION

The one-of-a-kind possibility offered by IWBP to dynamically model in space and time the resources to be deployed in an incident area as well their interactions, bring to a next level the training phase of emergency managers and first responders. In fact, first responders can visualize prior to practically execute the exercise, the assigned tasks, familiarize with them and eventually to critically revise them in accordance with the Incident Commander understanding of the situation. For the Piraeus Port Joint Action, HMOD after having completed the Drill Authoring, on the day of its practical execution the Incident Commander launched the drill when the Joint Action started. With respect to the Drill developed with the Authoring Tool, during the real exercise a connectivity was activated between the IWBP platform and the resources.

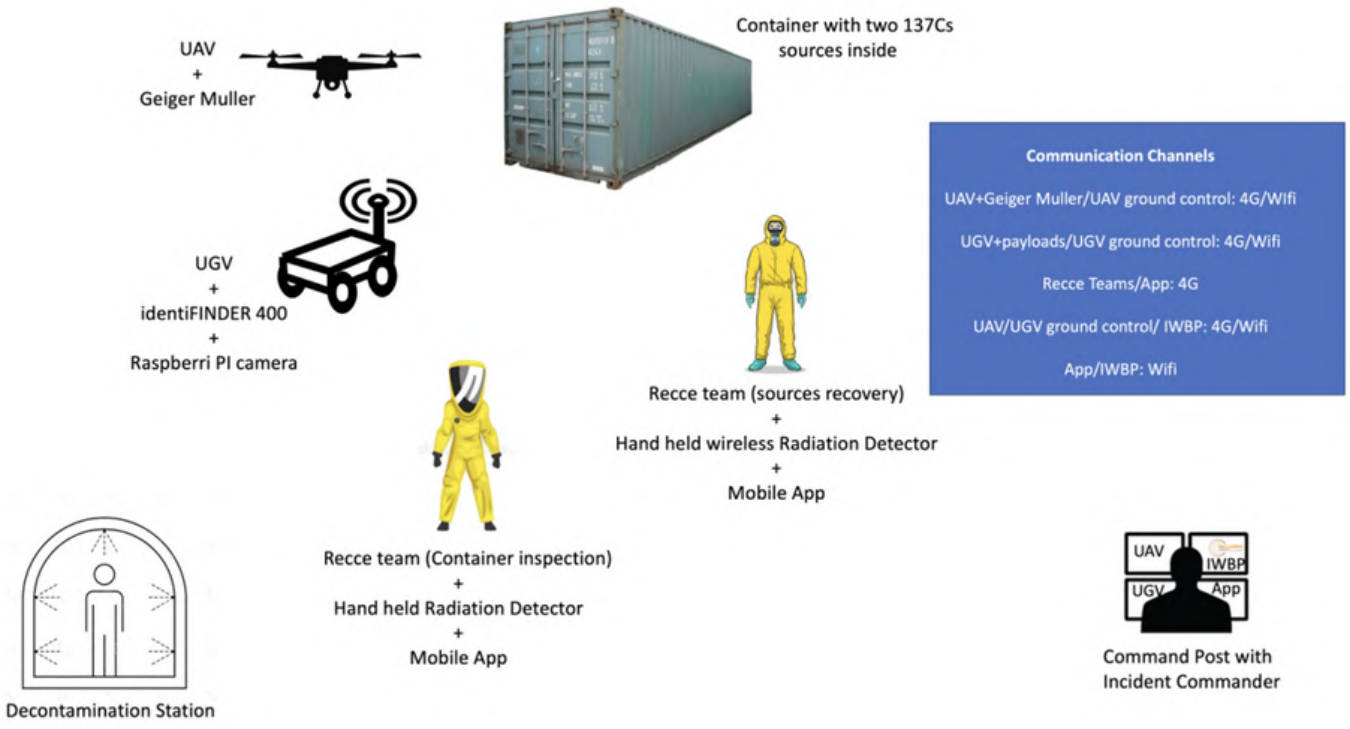


Fig. 11. The connectivity scheme of the resources deployed in the Piraeus port Joint Action

TECHNICAL CORNER: THE INCLUDING WEB BASED PLATFORM AT THE PIRAEUS PORT JOINT ACTION

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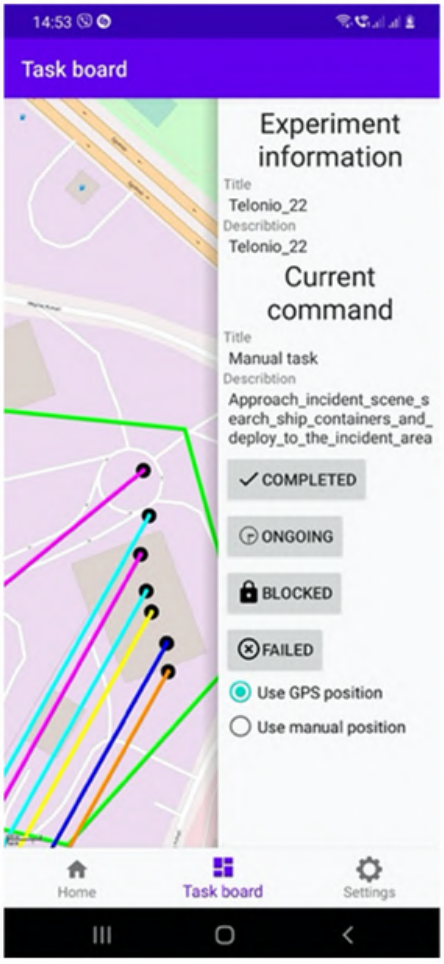

Fig. 12. Screenshot of the IWBP mobile application used by the Recce team to communicate with the Incident Commandert

MEET THE EXPERT: ALEKSEJUS LIVSIC

ALEKSEJUS LIVSIC IS A HEAD OF THE NUCLEAR SECURITY CENTRE OF EXCELLENCE (NSCOE) AT THE BORDER CONTROL MANAGEMENT BOARD OF THE STATE BORDER GUARD SERVICE OF THE REPUBLIC OF LITHUANIA. HE HAS GOT AN EXTENDED PARTICIPATION IN THE IAEA PROJECTS PORTFOLIO. FROM 2016 TO 2019 HE HAD BEEN CHAIRING THE NUCLEAR SECURITY SUPPORT CENTRES NETWORK THAT CONSIST OF MORE THAN 60 INSTITUTIONS FROM ALL OVER THE GLOBE. HE CONTRIBUTED SIGNIFICANTLY TO THE PROGRESS OF THE NETWORK AND SUPPORTED INTENSIFICATION OF THE NETWORK'S MEMBERS COLLABORATION.

Mr Livisic, how the Nuclear Security Centre of Excellence supports and enhances nuclear security personnel capacity building?

The activities of the NSCOE are designed to meet national needs that are based on an analysis of different jobs with nuclear security functions throughout the various organizations within the nuclear security regime. This meant that we are working with the number of stakeholders having different scope of activities with each of them. Those are organizations responsible for:

- the use or storage of nuclear or other radioactive materials;
- the protection of borders;
- implementation of a nuclear security detection architecture;
- response to nuclear security events.

In many cases, workers in these organizations can have jobs that focus entirely or partly on nuclear security functions and duties. Since we are working with key law enforcement institutions, it is important to ensure that we provide the maximum of support with the minimum time consumption. Therefore, we focus on short job-specific training activities rather than education.

The NSCOE's training is a combination of skill-building activities, including coaching and instruction, with the purpose of preparing an individual or team to perform a specific task, job or a series of jobs. Training is tailored to meet specific needs (e.g. solving a performance problem, using new or unfamiliar equipment, complying with a regulatory mandate).

Every training is based on training needs analysis which is a complex activity that involves assessment of the organizational performance, incidents occurred, equipment that is used and also analyze the specific jobs description. Usually, job description contains the list of functions that need to be performed. An analysis of the job description feeds into the list of expected competences that are necessary for this particular job. Finally, after the training implementation, we analyze the effectiveness of training itself that allow to define corrections needed.
Such systematic approach to training makes it the most effective and justify the resources spent on it.

From your experience, what are the main drivers when it comes to organize field exercises in nuclear security?

- An exercise needs to be based on periodical plans or as alternative, to be organised due to specific reasons. For instance, an exercise can be triggered by:

- Need to test new/ corrected procedures or plans. Here an exercise helps to check whether these documents are effectively guide performance, cooperation or coordination activities.

- New Legal acts development. This is about the major legislation which assigns new responsibilities to organisations.

- Unexpected threat or incidents. An exercise can help to assess if the responsible organisations are capable to deal with the threat/ not to allow an incident to happen again. Also what additional resources are needed to close the gaps, if any.

- To test interagency cooperation and coordination plans. This is a way to check vertical and horizontal cooperation as well as information management.

- Importantly, local, low scale exercises usually are used to test the competences of personnel while full scale exercises are aiming to test response plans and assess the capacity of entire organisations.

What is the most important for an effective exercise?

First of all, the key pre-condition of successful exercise – is a consent within participating organisations and exercise development team on the necessity, scope and expected outcomes of the exercise itself. This is usually time and resource consuming activity; therefore, all the parties should agree and contribute to it.
Another key of the successful exercise is a stress on preparatory activities. This involves the following steps:

- Identification of goals and objectives of the exercise;
- In depth analysis of the valid legal framework; organisational capabilities and practises used; organisational concept of operations and local standard operational procedures; valid response plans; technical infrastructure and HRD applied.
- Development of scenario that the best fit to achieve the objectives set;
- Development of evaluation guide and evaluation criteria.

Finally, the comprehensive evaluation part will allow feasible and practical improvement suggestions.

How much relevant is the evaluation phase of the exercise and how should it be organized?

Organizations are able to assess their capabilities and needs while accomplishing a mission, function, or objective through the evaluation process. Evaluation is a very specific and important part of the exercise. It is performed by the Evaluators team leaded by the Lead evaluator. The team should be independent and ideally belong to the organisation which does not participate in the exercise. The success of evaluation depends on the professional competences of evaluators as well as their preparations for the exercise. Evaluators must be study and be familiar with the procedures and activities that are demonstrated on scene.

Effective event evaluation involves the following:

1. Observing the event and collecting data during the conduct phase using the Event Evaluation Guide.
2. Conducting a debrief immediately following the exercise with the participants.
3. Collecting data from the Participant Feedback Forms (Participant Critique).
4. Analyzing data collected regarding strengths and areas for improvement.
5. Recording findings in the draft After Action Report.

Using a common approach to evaluation supports consistent and meaningful reporting of the event results. Event Evaluation Guide provides a consistent guidance of the event evaluation and data collection and should reflect event objectives and capabilities assessment.
As a reference metrics during the evaluation process the Evaluation criteria are used. An Evaluation criterium is an operational competency statement against which the evaluation is done. Usually, the number of specific Evaluation criteria are corresponding to each learning objective. The data gathered during the event's evaluation process will become a part of AAR and is critical to identified gaps. After the completion of the event, these gaps usually will be captured in the Improvement plans and/or will feed into the new training needs assessments.

How do you think INCLUDING can support innovation uptake in the nuclear security domain?

Including unites nuclear security field practitioners and science. Therefore, it provides a forum for discussions between these two societies as well as to test certain technologies. Such technology testing in the operational conditions may result in the follow-up development and improvement aiming to have technology user friendly interface and simplified maintenance. These two are the critical conditions for practitioners to accept and utilise any equipment.

Another thing, Including itself raises awareness within the European member states governments, institutions and civil society on the threats and potential negative consequences of the nuclear security events. Such awareness should encourage them to provide resources and other support in capability development in this field.

JOIN INCLUDING COMMUNITY

If you need more information about the project or would like to participate during the INCLUDING events and demonstrations activities, please don't hesitate do contact us!

Please, stay tuned on our project website and twitter channel for updates and registration procedures for the INCLUDING events!

- Joint Action in Mikkeli (Finland) – 13/16 September 2021
- Joint Action in Saclay (France) - 20/22 October 2021

INCLUDING: INNOVATIVE CLUSTER FOR RADIOLOGICAL AND NUCLEAR EMERGENCIES

Horizon 2020, Topic SU-GM01-2018-2019-2020: Pan-European clusters of practitioners and other actors in the field of Security - Innovation clusters from around Europe managing demonstration sites, testing workbenches, and training facilities.