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eNOTICE-2

EU Network of Training Centres for preparedness to CBRN Events

D4.2 Final CBRN SimEx

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Executive Summary

The eNOTICE-2 project represents a significant step forward in enhancing Europe's preparedness and response capabilities for Chemical, Biological, Radiological, and Nuclear (CBRN) incidents. Building on the base laid by the original eNOTICE network, the project brought together a wide range of CBRN stakeholders, including first responders, crisis managers, civil protection personnel, researchers, technology developers, and policymakers, to create a cohesive, collaborative, and cross-border network for training and operational readiness.

In alignment with this goal four simulation exercises (SimEx) were planned and organised, each designed to test and refine procedures for CBRN response, with particular attention to vulnerable populations and the decontamination of assistive devices such as wheelchairs, hearing aids, and prosthetics. The final simulation exercise, held in November 2025 in Soave, Italy, was structured around a complex tabletop scenario simulating a deliberate biological attack during the 2026 Winter Paralympic Games. This exercise tested participants' ability to recognise the threat, coordinate multinational response efforts, conduct environmental and clinical sampling, and implement effective decontamination and evacuation procedures under realistic operational conditions.

The final SimEx not only validated previously developed guidelines and procedures but also showcased the innovative VR training scenarios developed by Fondazione SAFE and METU. The exercise was complemented by a final conference that gathered representatives from EU institutions, first responders, research centres, and industry stakeholders, providing a forum for knowledge exchange, discussion of project outcomes, and planning for future CBRN preparedness initiatives.

In sum, the eNOTICE-2 Final SimEx highlighted the importance of evidence-based, inclusive, and technologically informed approaches to CBRN emergency management, while providing concrete lessons, recommendations, and tools to strengthen European response capacities.

List of abbreviations

Abbreviation	Definition
CBRN	Chemical, Biological, Radiological, and Nuclear
EC	European Commission
EU	European Union
FDDO	Stadt Dortmund
FR	First Responder
GA	Grant Agreement
JCBRND COE	Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence
SimEx	Simulation Exercise
SOPs	Standard Operating Procedures
TTX	Tabletop Exercise
UCLouvain	Universite Catholique de Louvain
UCPM	European Union Civil Protection Mechanism
WP	Work Package

List Of Figures

Figure 1 TTX participants attending the scenario briefing	12
Figure 2 Parallel guided discussion.....	13
Figure 3 TTX Observer monitoring the discussions	13
Figure 4 TTX Participants division into groups and group work	16
Figure 5 Sampling activities.....	16
Figure 6 TTX Participants present their solutions post-decision making	16
Figure 7 Final debriefing between Participants and Observers.....	17
Figure 8 Participants trying eNOTICE-2 VR scenarios.....	19
Figure 9 eNOTICE-2 VR scenario	20
Figure 10 Lab environment in the VR simulation.....	21
Figure 11 A screenshot from the step of inserting the transfer container carrying the contaminated object.....	22
Figure 12 A screenshot of a user brushing a contaminated hearing aid inside the glovebox ..	22
Figure 13 A screenshot representing the waste management with discarding a used decontamination towel.	23
Figure 14 Final Conference presentations.....	27

Table of Contents

Executive Summary	4
List Of Figures	6
1 Introduction.....	8
1.1 eNOTICE-2 Objectives	8
1.2 Scope of WP4 and key objectives of T4.4.....	9
2 Methodological approach.....	10
3 Overview of the Final CBRN SimEx.....	11
3.1 Final Table-Top Exercise	11
3.1.1 Participants	11
3.1.2 Scenario description	14
3.1.3 Key TTX Learning objectives	15
3.1.4 Conclusions and recommendations.....	17
3.2 Showcase of Virtual Reality Demos.....	18
3.2.1 VR demo by Fondazione SAFE.....	18
3.2.2 VR demo by METU.....	21
3.3 Final Conference.....	24
3.3.1 Conclusions	27
4 Conclusions and way forwards.....	28
Annex 1.....	29
Agenda of the Final SimEx	29
Annex 2.....	32
Pictures From The Final Simex	32
Annex 3.....	43
Reporting Checklist.....	43
Annex 4.....	55

1 Introduction

1.1 eNOTICE-2 Objectives

Over the past years, the threat posed by intentional, accidental, and Chemical, Biological, Radiological, and Nuclear (CBRN) events of natural origins has driven governments and international organisations to implement comprehensive regulations and programs. These efforts aim to protect populations from associated risks, complementing national measures that address existing gaps and promote the exchange of information and best practices.

To enhance preparedness for CBRN incidents, whether deliberate, accidental or natural, the eNOTICE Network of CBRN Training Centres project was launched in 2017 and concluded in August 2023. This initiative, funded under the European Union's Horizon 2020 research and innovation programme established a global network of civilian and military CBRN Training Centres (TC), testing facilities, and demonstration sites, aligning with the general objectives of the European Union Civil Protection Mechanism (UCPM). The network includes 53 TCs across 22 countries (17 EU Member States and 5 non-EU countries), emphasising multidisciplinary, multi-agency training to improve interoperability. It also fosters cross-border collaboration through standardised approaches that align with neighbouring countries' procedures, legal frameworks, administrative protocols, and organisational structures. A series of training scenarios were used to address combined chemical, biological, and radiological threats, both accidental and deliberate, as well as hybrid and emerging threats, with a focus on testing and validating innovative technologies at various development stages.

The eNOTICE-2 project builds upon the foundation of the eNOTICE network, supported by civil protection actors from participating Member States and UCPM countries. eNOTICE-2 aims to enhance overall preparedness and rapid response capabilities for major cross-border crises involving C, B, or RN agents, individually or in a hybrid scenario. eNOTICE-2 draws lessons from eNOTICE and from gaps identified during 17 Joint Activities (JAs), including field exercises, tabletops, simulations, and serious gaming exercises.

Despite the availability of resources, expertise, and protocols, there remains a significant gap in the knowledge most FRs have of CBRN decontamination, as consistently identified during eNOTICE. This issue is also a priority under UCPMs rescEU CBRN objectives. Currently, no standardised EU-wide guidelines or procedures exist for the decontamination of assistive devices of vulnerable groups. Challenges include ensuring the safety of both first responders and affected individuals, especially during prolonged operations involving large groups. The emergence of new CBRN threats, such as Novichok agents and evolving biological threats, including toxins, further complicates the landscape, necessitating regular updates to practices, guidelines, and policies.

To address these challenges, eNOTICE-2 introduces several new dimensions aimed at producing tangible effects at both institutional and individual levels. The project adopts a comprehensive approach to CBRN decontamination, considering both conventional and emerging threats and addressing the specific needs of vulnerable people. A key focus is on the decontamination of assistive devices used by vulnerable individuals, such as wheelchairs,

hearing aids, and prosthetic limbs. This broader perspective enhances the diversity of organisations contributing to DRM and strengthens the UCPM framework while supporting EU Member States' civil protection mandates.

The project engages a broad spectrum of CBRN stakeholders, including first responders (FR), crisis managers, civil protection personnel, training professionals, technology developers, policymakers, and civilian volunteers. Intensive activities promote knowledge sharing, comparing operational procedures, identifying best practices, and strengthening partnerships between civil protection and Disaster Risk Management (DRM) actors. This cross-sector collaboration supports the integration of promising scientific research, innovative DRM tools, and enhanced training content. The project actively engages end-user communities, including advisory groups of individuals with disabilities, to guide project outcomes and provide critical feedback. This engagement raises awareness among citizens and authorities about CBRN risks, incorporates the needs and concerns of vulnerable populations, and identifies strategies to reduce their exposure and vulnerability.

Against this background, eNOTICE-2 facilitates ongoing collaboration through **four simulation exercises**, ensuring effective coordination, compatibility, and complementarity among all participants. This deliverable, D4.2, follows the D4.2 “Report on Three SimEx Preparation, Organisation, Results” by reporting on the final and fourth SimEx.

1.2 Scope of WP4 and key objectives of T4.4

Within the frame of the eNOTICE-2 Project, the Work Package 4 “Simulation exercises” has several key objectives as follows:

- To improve and maximise the project outcomes, organising SimEx (in the form of TTX) where CBRN Joint Activities from eNOTICE-1 will be reused to outline and assess main differences and similarities between operational procedures applied across different Member States (MS).
- To consider C, B, RN, and CBRN risks offering a multi-angle perspective on the type of event (accidental, intentional, or natural).
- To mainly focus on decontamination procedures, with a particular attention to decontamination challenges posed by vulnerable people and eventual supporting devices (e.g., wheelchairs, hearing aid). The findings and results will feed to WP5 recommendations.
- To generate a comparative matrix to assess the various approaches tested in eNOTICE-2 and assist decision-makers at national and EU level in determining whether improvements in national or EU procedures should be proposed and/or implemented.

Within this WP, three SimEx were held under eNOTICE-2, namely the first SimEx organised by FDDO in Dortmund (20th April 2024), the second SimEx organised by JCBRN Defence COE in Vyškov (25-29 November 2024), and the third SimEx 3 organised by Campus Vesta in Ranst (5-7 June 2025).

Under WP4, Task 4.4 “Final CBRN SimEx” (M21-M24), as described in the Grant Agreement (GA), has the following scope: “A final SimEx will focus on the CBRN threat from its broad D4.2 Final CBRN SimEx (PU)

perspective. This activity will aim at testing a tentative harmonised approach, defined according to results of the previous SimEx as well as to guidelines produced in WP5. SDS creation procedure will be validated. To maximise the result, dissemination to stakeholders from TCs, industry, research, DG ECHO, and CEN TC391, this SimEx will be merged with the project Final Event.” Fondazione SAFE oversees the management of this task and has been supported by UCLouvain, METU, UNITOV, VESTA, FDDO, JCBRND COE, and WMP.

Against this background, this deliverable provides an overview of the delivery of the Final CBRN SimEx hosted by Fondazione SAFE on 26th and 27th November 2025. As mentioned above, in order to maximise the results, the SimEx has been merged with the project's final event. Therefore, the SimEx organised by Fondazione SAFE included the following key elements:

- Final Table-Top Exercise
- Final Showcase of VR Demos developed by Fondazione SAFE and by METU
- Final Conference event.

The following paragraph will, firstly, briefly explain the methodological approach adopted for the reporting on this event and afterward provide an overview of all the above-mentioned agenda items, highlighting the key results achieved.

2 Methodological approach

The methodology adopted to report on the implementation of the fourth and final SimEx will adopt a twofold approach in order to reflect the complexity of the articulation of the activity. Firstly, this document will provide a deep overview of each of the key components of the event, including the Table-Top Exercise, the Final Showcase of VR Demos developed by Fondazione SAFE and by METU, and the Final Project Event.

This report will also analyse the Final SimEx applying Reporting checklist adopted for the D4.2. In detail, as deeply described in D4.2, this reporting methodological approach reflected the work done within the first eNOTICE project and uses the same reporting structure established within the previous phase of the project.¹ This methodology is designed to support the reporting on Joint Activities² and contains a standardised reporting checklist. Given the relevance of this methodology, eNOTICE 2 Project has adopted this approach to report on the implementation of the SimEx held during the project duration. In detail, the following sections have been considered for reporting on the SimEx 4: Preparation/organization of the SimEx; Conduction of the SimEx; Evaluation of the SimEx.

¹ D4.6 ‘eNOTICE Joint Activities Planning, Report 5’. Available at <https://cloud.h2020-eNOTICE.eu/index.php/s/bk6bZXejazEzdSf>

² For the purpose of this deliverable, the terms SimEx and Joint Activity will be used interchangeably. Indeed, the definition of Joint Activities as per the eNOTICE project is “*Exercises for first responders or civil protection practitioners organised by CBRN TCs as part of their regular educational or training activities, opened up to external stakeholders, which allows for the activity to be combined with tests, validations or demonstrations*”.

As such, the Simulation Exercises of eNOTICE-2 can be considered JAs as defined in eNOTICE project. Therefore, it emerged that all the findings, methodology of preparation, planning, organisation, and reporting on JAs are fully relevant for eNOTICE-2 SimEx and are included in this deliverable.

3 Overview of the Final CBRN SimEx

The **Final CBRN SimEx** was hosted at the premises of Fondazione SAFE on 26th and 27th Novembre 2025. In detail, the agenda of the SimEx was articulated over 2 days. The final agenda is attached in Annex 1. As anticipated, the agenda includes the following key elements:

- Final Table-Top Exercise held in Baita Calvarina, (Roncà, Verona)
- Showcase of VR demo developed by Fondazione SAFE and by METU, hosted at Fondazione SFE Testing & Training Facility (Roncà, Verona).
- Final Event hosted at Borgo Rocca Sveva (Soave, Verona) and remote meeting.

In total, the event was attended by 71 representatives coming from 10 European countries.

3.1 Final Table-Top Exercise

The Final Table-Top Exercise (TTX) was organised by Fondazione SAFE with the support of UCLouvain. As this TTX represented the final project exercise, the objective was to bring forward the key results and lessons learned and identified in the other three SimEx implemented throughout the project lifetime³, as well as to put into practice the tools developed in the eNOTICE-2 project, including, but not limited to, the guidelines produced in WP5 and the Safety Data Sheet (SDS) – Additional Information On Scene (AdInOS) developed under WP3.⁴

Against this background, the focus of the final Table-Top Exercise was mainly on the procedures for effective decontamination following a CBRN threat. In detail, for the **decontamination of vulnerable groups of the population, especially individuals with disabilities and their assistive devices** (including electronic components and/or made of sensitive materials). Moreover, another key element of the TTX was the **cross-border element of the scenario**, therefore foreseeing the participation of First Responders (FRs) from different countries in order to test and improve the coordination capacity in response to a large CBRN event.

3.1.1 Participants

Participants in the TTX were divided into two groups, namely **Actual TTX participants** and **Observers**.

To ensure an international representation and to achieve the key objective of testing the capacity to respond to a large CBRN event, participants of the TTX were identified through the following channels. Fondazione SAFE, supported by UCLouvain, requested the eNOTICE-2 Consortium partners to engage national FRs (ideally 1 or 2 FR per country). In addition, thanks to its involvement in the programme, Fondazione SAFE invited representatives from the rescEU-

³ SimEx 1 in Dortmund (20th April 2024), SimEx 2 in Vyškov (25-29 November 2024), and SimEx 3 in Ranst (5-7 June 2025).

⁴ Further referred as Additional Information on Scene (AdInOS) document.

programme, in this context, delegates from Finland, Germany, Croatia and Romania were present, ensuring a wide range of operational perspectives and strengthening the multinational dimension of the TTX. Finally, as a result of the excellent collaboration of UCLouvain with the Disaster Resilience Knowledge Network (DIREKTION network), participants from this Network requested to join the TTX.

The presence of representatives from DG ECHO was particularly important, as they not only observed but also actively participated in the TTX, providing valuable insights and feedback. Their involvement contributed to aligning the exercise outcomes with broader EU civil protection priorities and reinforced the practical relevance of the TTX discussions. This element will be further analysed in D 4.3.

In total, 27 representatives actively participated in the TTX and were the following:

- 2 participants from the Czech Fire Rescue Service
- 4 participants from Joint CBRN Defence Centre of Excellence Vyskov
- 1 participant from University of Rome Tor Vergata
- 2 participants from Fondazione Policlinico Universitario Agostino Gemelli – Hospital
- 2 participants from CBRN Italian Air Force
- 1 participant from DG ECHO
- 2 participants from UCLouvain
- 2 participants from Campus Vesta
- 2 participants from West Midlands Police
- 1 participant from German rescEU program
- 2 participants from Directorate of Civil Protection (rescEU Croatia)
- 1 participant from Head of Integrated Operational Planning Unit (rescEU Romania)
- 1 participant from Italian Air Force
- 1 participant from Hungarian Gov – federation of Firefighters
- 1 participant from JCBRND COE
- 2 participants from the Dortmund Fire Department



Figure 1 TTX participants attending the scenario briefing

D4.2 Final CBRN SimEx (PU)

In addition, all other invited guests participated in the TTX as observers. Located in an adjacent room, they were able to follow the exercise via a dedicated audio-video link, which allowed them to closely monitor the discussions and the evolution of the decision-making process. They were also assisted by two moderators from Fondazione SAFE, who guided the observers in their parallel discussion. This arrangement enabled the observers to comment on and evaluate the operational choices made by the participants, contributing reflections based on their own professional experience. During an interactive discussion, they provided concrete examples and assessed the feasibility of the various response options considered during the exercise. Their observations were particularly valuable in analysing the dynamics of cooperation between different agencies and institutions from several Member States, as well as in validating the effectiveness of emergency coordination mechanisms and the ability of emergency teams to operate under conditions of stress and uncertainty.



Figure 2 Parallel guided discussion



Figure 3 TTX Observer monitoring the discussions

3.1.2 Scenario description

The scenario developed for the final SimEx was conceived as a direct continuation of the narrative initiated during the TTX in Ranst (Belgium, June 2025), ensuring full consistency with the integrated and iterative approach adopted throughout the eNOTICE-2 project. The Ranst exercise simulated the intentional release of a biological agent during a large outdoor public event, illustrating the shift of organised criminal networks towards asymmetric and unconventional methods of revenge. Building on this framework, Final TTX expanded the plot by placing the threat in a more complex geopolitical context and involved a CBRN threat occurring indoor during the Paralympics in Italy, necessitating the decontamination of participants and their assistive technology.

The Final SimEx, was designed to focus on managing the consequences of an intentional biological attack occurring during the 2026 Winter Paralympic Games hosted in northern Italy. In the scenario, a deliberate release of *bacillus anthracis* spores was carried during a dinner held at the Paralympics Village restaurant in Ardenia. During the dinner approximately 200 individuals, including Paralympic athletes, their relatives, accompanying personnel, and several guide dogs, were present. The bacteria was disseminated via a handheld perfume diffuser, so the spores spread throughout the dining area without raising immediate suspicion. The following morning, multiple participants began displaying symptoms such as fever, respiratory distress, and gastrointestinal discomfort. Their joint presence at the previous evening's dinner led medical staff to suspect a potential CBRN event of biological origin. This necessitated rapid coordination between first responders, national authorities, and EU-level capabilities.

The scenario required participants to address the full response spectrum: recognising the biological attack, performing environmental and clinical sampling, and coordinating the deployment and operation of rescEU mobile laboratories for detection, identification, and analysis. Particular attention was paid to defining appropriate decontamination strategies, given the presence of athletes who use electronic prostheses, wheelchairs, hearing aids, respiratory devices, and other assistive technologies. Furthermore, winter conditions, characterised by low temperatures and high humidity, further complicated decontamination operations, particularly for devices that are sensitive to steam sterilisation methods.

The scenario also incorporated a cross-border dimension, reflecting the multinational nature of the Paralympic Games. Italy's full rescEU CBRN detection, sampling, and monitoring capacity was mobilised, while Croatia, Germany, and Finland contributed pre-deployed CBRN decontamination assets. Participants had to manage the operational link between these national and European resources, evaluate laboratory results, and plan the medical evacuation of affected individuals to nearby hospitals.

Overall, the TTX provided a realistic and challenging framework for testing interagency coordination, technical decision-making, and multinational interoperability in response to a high-impact biological threat affecting a major international event and vulnerable populations.

3.1.3 Key TTX Learning objectives

Generally speaking, the goal of the TTX was to test and validate response procedures for large-scale CBRN emergencies, focusing not only on those elements directly addressed by the eNOTICE-2 projects, but rather broadening the focus to also include testing emergency response guidelines designed under other EU-funded initiatives, especially within the framework of the rescEU-programme. In this sense, the TTX represents a unique opportunity for cross-programme synergies and assesses the cooperation of different European capacities when confronted in a complex scenario.

Within this goal, the TTX guided participants through a series of operational challenges that required the timely recognition of a biological attack based on initial clinical indicators and situational signals. Therefore, one of the learning objectives of the TTX was precisely to enable participants to quickly recognise and interpret the unusual symptoms associated with a CBRN attack. Participants then had to carry out sampling activities both at the scene of the incident and on the people involved, ensuring the safe collection, manipulation and transfer of potentially contaminated materials, in compliance with strict chain of custody standards. These samples constituted the basis for laboratory analysis in order to identify the biological agent involved and integrate this information into real-time decision-making. Another important objective was to identify the most appropriate decontamination approach, taking into account the number of athletes and companions using electronic prostheses, mobility aids, hearing devices, and respiratory equipment. A key element of this stage was finding the correct method for decontaminating both the scene and the people involved, considering the vulnerabilities associated with the technological devices used by the disabled people implicated. In addition to this, environmental conditions such as low temperatures and high humidity were another factor to be taken into account when determining the correct decontamination method. Following this assessment, participants had to learn how to coordinate the complete decontamination of all people exposed to the biological agent, including adapting procedures to ensure accessibility and safety for people with disabilities and their accompanying service animals.

To further support the learning objectives, participants were organised into balanced groups, distinguishing between active TTX participants and observers, and ensuring a diverse mix of first responder profiles within each group. This approach enabled a comprehensive 360-degree overview of different operational perspectives, allowing participants to better understand how various actors are required to respond during a CBRN emergency. Moreover, it contributed to the collection of targeted feedback and fostered a general understanding, thereby supporting enhanced cooperation and collaboration in future CBRN response scenarios.

Finally, the exercise placed significant emphasis on organising the medical evacuation of affected individuals to appropriate hospitals. This involved evaluating clinical priorities, coordinating with emergency medical services, and selecting hospitals based on proximity, capacity, and specialised capabilities, thereby demonstrating the importance of integrated emergency planning at local, national, and EU levels.

Through these interconnected activities, the TTX provided a comprehensive environment in which to evaluate preparedness, enhance operational coordination, and validate multi-programme European response capacities in the face of a high-impact bioterrorist event.



Figure 4 TTX Participants division into groups and group work



Figure 5 Sampling activities



Figure 6 TTX Participants present their solutions post-decision making



Figure 7 Final debriefing between Participants and Observers

3.1.4 Conclusions and recommendations

The Final CBRN SimEx represented an important milestone in the Enotice-2 project, consolidating the lessons learned across previous exercises and providing a comprehensive way to evaluate the cooperation between national and European response mechanisms. Through the active engagement of participants and observers from multiple Member States, the TTX highlighted the progress achieved in harmonising CBRN response capacities all over Europe. Overall, the exercise confirmed the effectiveness of established detection, sampling and identification protocols, as well as the importance of clear coordination mechanisms in large-scale emergencies involving cross-border resources. The scenario, furthermore, highlighted the challenges related to the management of vulnerable populations, particularly the need for adaptable decontamination procedures that ensure safety of people using electronic assistive technologies. Participants also identified the need to improve communication flows between operational teams and laboratories, improve the timeliness of analytical feedback, and further refine evacuation procedures in situations with a high number of victims.

During the final debriefing between observers and participants, several recommendations emerge. First, it is essential to continue investing in joint training and large-scale exercises to strengthen operational cohesion and facilitate mutual understanding between different response agencies. Second, emergency guidelines should be further updated to reflect technological developments in assistive devices, ensuring that decontamination protocols are effective and inclusive. Finally, the strong engagement of observers indicates the importance of maintaining structured observation and feedback components in future exercises, as these contribute significantly to collective learning and the continuous improvement of CBRN preparedness across Europe.

In conclusion, the final SimEx not only validated the results achieved through eNOTICE-2 but also provided concrete guidance for future capacity-building efforts, reaffirming the importance

of coordinated, evidence-based, and inclusive approaches to CBRN emergency management within the European Union.

3.2 Showcase of Virtual Reality Demos

The final SimEx was also an opportunity to showcase the Virtual Reality Demos developed by Fondazione SAFE and by METU, focused on the decontamination of assistive devices. The showcase of the VR demo was organised at the premises of Fondazione SAFE Testing and Training Facility at Roncà, Verona. Participants could explore the VR scenarios designed within the eNOTICE – 2 project and understand their potential contribution to training and operational preparedness. All invited guests were given the opportunity to participate freely in the showcase. The facility was arranged with multiple stations featuring activities and presentations from various projects, allowing attendees to engage with a wide range of informative displays. In this context, participants had the chance to test the eNOTICE – 2 scenarios, described in detail later in this deliverable, or alternatively to observe them thanks to an exhibition designed to provide both immersive engagement and passive viewing. This setup ensured that all attendees could obtain a clear and comprehensive overview of the tools developed under eNOTICE-2. Throughout the showcase, the Fondazione SAFE team remained available to provide explanations, answer questions, and facilitate understanding of the presented tools and methodologies. This approach enabled participants to give informed feedback and contributed to a deeper appreciation of the project's outputs and their potential application in future CBRN training and response activities.

3.2.1 VR demo by Fondazione SAFE

Fondazione SAFE showcased the VR Project “Dry Decontamination with VHP System”. The main purpose of the virtual reality application designed by Fondazione SAFE is to provide an effective training tool for the use of a decontamination system by simulating a VHP (Vaporized Hydrogen Peroxide) decontamination process (i.e., dry decontamination). The aim is for VR trainees to configure the DECON environment, monitor the main physical parameters (humidity, temperature, volume of the containment area), and initiate the VHP decontamination process remotely. Different from the Wet DECON, once launched, the entire procedure runs without personnel inside the tent.

In alignment with the key objectives of the eNOTICE-2 project, the focus of the VR is on the decontamination of electronic devices and, in particular, electronic assistive devices of vulnerable groups.

The application is structured around 4 different scenarios with an increasing level of complexity. Therefore, it allows intuitive and dynamic learning, offering the possibility to expand scenarios and training tasks based on future needs. Training begins with a step-by-step guided tutorial, in which the operator receives clear instructions through pop-ups and visual indicators to safely learn all the fundamental procedures associated with the VHP system. After this initial guided phase, the VR application introduces intermediate and advanced environments with reduced assistance, enabling trainees to practice decision-making with greater autonomy. A final scenario presents variable conditions encouraging users to identify

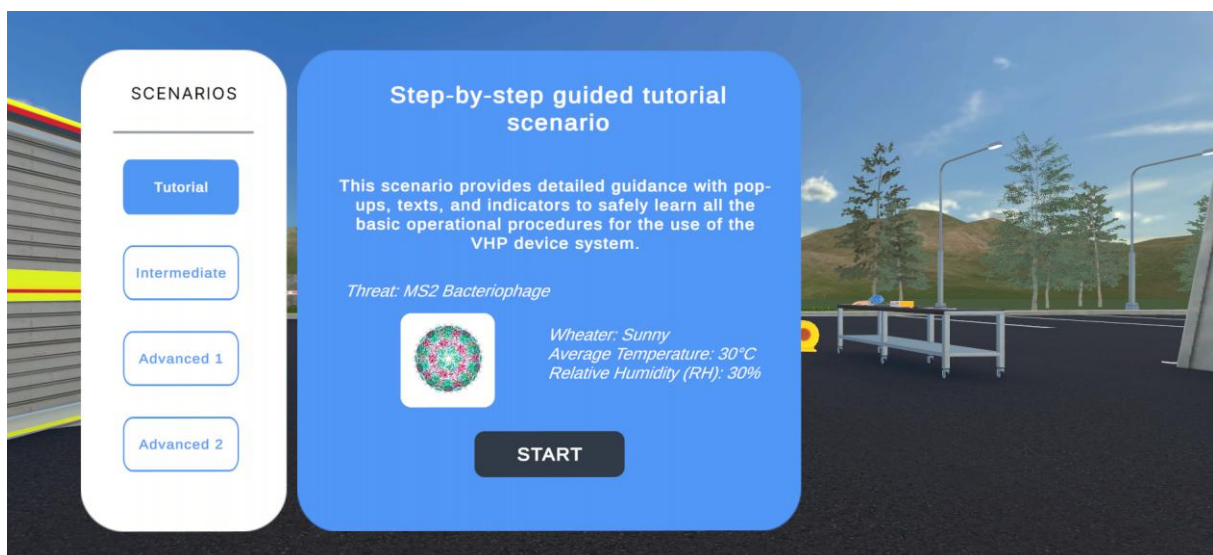
and correct issues on their own. This structured progression ensures a realistic operational training experience.

A key feature of the VR application developed by Fondazione SAFE is that it allows simultaneous collaboration between multiple operators within the same virtual environment. This capability replicates real-world conditions, improves coordination skills and strengthens teamwork-based decision-making dynamics, making the VR system a valuable and flexible tool for preparing first responders to manage CBRN decontamination processes involving vulnerable populations and technologically sensitive equipment.

Overall, from the feedback of the participants testing the VR demo developed by Fondazione SAFE, it emerged that the tool was highly appreciated, particularly for its multiplayer functionality. Partners and invited guests highlighted that the possibility for multiple operators to interact simultaneously within the same virtual scenario significantly enhanced the realism of the training experience. This feature was considered a strong added value, as it supports team coordination, shared situational awareness, and joint decision-making.



Figure 8 Participants trying eNOTICE-2 VR scenarios





3.2.2 VR demo by METU

Within the eNOTICE-2 project, a stand-alone virtual reality (VR) glovebox training scenario has been developed by the Middle East Technical University (METU) team. The scenario is part of the project's broader work on decontamination of assistive devices for vulnerable people and complements the experimental and guideline-oriented activities in WP5 and the simulation exercises in WP4.

The VR experience focuses specifically on the decontamination of personal assistive devices used by vulnerable individuals in a CBRN emergency, such as a contaminated mass-casualty setting at a public event. In line with the project's emphasis on protecting vulnerable people and enabling safe re-use of their devices in parallel with the decontamination of their owners, the scenario addresses typical items such as a hearing aid, eyeglasses, and a lower-limb prosthetic socket. At the beginning of the simulation, the trainee is asked to select which assistive device will be processed, reinforcing the idea that the same protocol must be adapted to different materials, shapes, and levels of technical complexity.



Figure 10 Lab environment in the VR simulation

The core of the scenario is a VR representation of a glovebox in a laboratory environment. The trainee first attaches a transport container carrying the contaminated assistive device to the side port of the glovebox and locks it in place, simulating real-world procedures to maintain containment. Then, opens up a switch to activate the filtered negative pressure vents in the glovebox that would prevent possible contamination through any leaks in the glovebox. Then the trainee puts on the elastic virtual gloves of the glovebox, opens the internal hatch, and transfers the device from the container into the main work chamber, paying attention to avoid spreading contamination inside the box.



Figure 11 A screenshot from the step of inserting the transfer container carrying the contaminated object.

Once the device is inside the glovebox, the simulation guides the user through a simplified but realistic decontamination workflow, reflecting the main steps identified in the project's experimental and guideline work while acknowledging that no single method is universally effective for all devices and conditions. Interaction mechanics such as grabbing, aiming, and spraying a decontamination agent, mechanical wiping and brushing, and manipulating the device to expose hidden surfaces are implemented as VR actions. The focus is on teaching the logical sequence of operations, on making the user aware of potential contamination pathways (e.g. joints, cavities, electronic components), and on encouraging reasoned choices between available options rather than reproducing every physical detail of real-world procedures. To mimic and guide reality, the objects to be decontaminated carry multiple colliders/hitboxes, representing their different parts. The players need to spray, brush, and wipe each spot for a set amount of time, indicating the need for a thorough decontamination process.

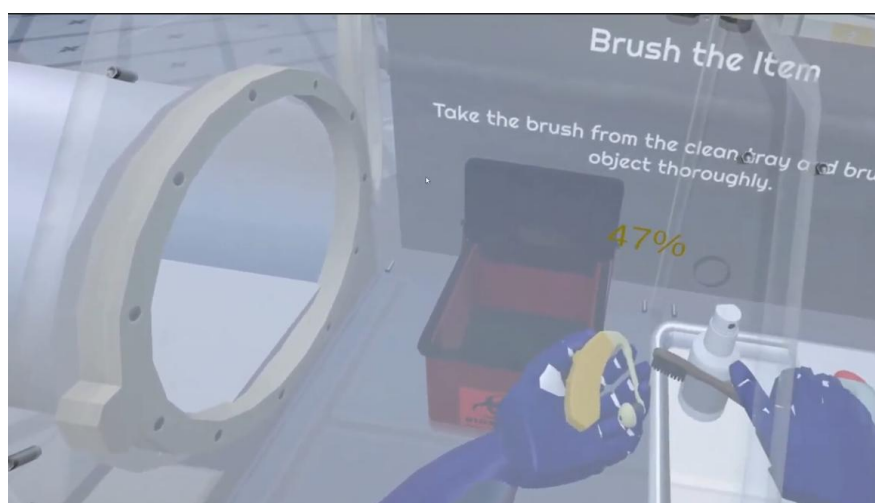


Figure 12 A screenshot of a user brushing a contaminated hearing aid inside the glovebox

Basic waste management is integrated into the scenario. Contaminated wipes, tools, and consumables must be segregated and placed into appropriate waste receptacles within the glovebox before the procedure can be completed. Only after the decontamination steps and waste-handling tasks have been carried out correctly can the trainee take the cleaned assistive device and place it in the outlet transfer chamber. After closing and securing that chamber from the inside, the trainee can take their hands out and take the decontaminated object out through the designated clean outlet from the outside. This final step reinforces the idea that properly decontaminated devices are essential for restoring the autonomy and dignity of vulnerable people after an incident and should not be discarded unnecessarily.



Figure 13 A screenshot representing the waste management with discarding a used decontamination towel.

To avoid overwhelming new users, the VR simulation is followed by small steps that are both narrated and also guided through in-game supporting UI billboards that tell the users what to do next. The use of complex movements and navigation is avoided to not frustrate the users who aren't proficient users of VR and keep the focus on the protocol training instead of VR proficiency.

Pedagogically, the VR glovebox scenario is conceived as an accessible protocol-training tool for both experts and non-experts who may be involved in decontamination operations but do not routinely work with gloveboxes. It allows users to familiarise themselves with the sequence and rationale of key steps, and practise hand-eye coordination in a constrained environment. Because it runs on a standalone VR headset and does not depend on a physical glovebox, the solution is scalable and can be deployed for introductory training, refresher sessions, or preparatory exercises in organisations that do not have ready access to specialised equipment. Technically, the simulation uses realistic 3D models, physics-based interactions, and a stepwise guidance system to ensure that users remain oriented throughout the procedure. Its modular workflow has been designed so that additional device types, alternative decontamination options, and more advanced decision-support elements can be integrated in future iterations. In

this way, the VR glovebox scenario provides a flexible and engaging VR component within eNOTICE-2's broader effort to improve preparedness and response for vulnerable people and their assistive devices in CBRN emergencies.

3.3 Final Conference

The final project conference took place on 27th November 2025, at Borgo Rocca Sveva in Soave, bringing together representatives from EU institutions, first responder organisations, research institutes, industry stakeholders and partners from multiple EU-funded initiatives. Merged with the activities of the fourth and final SimEx, the event provided a comprehensive platform to present, discuss and consolidate the results achieved throughout the project's lifecycle. Its primary purpose was to disseminate the project outcomes, foster dialogue across sectors, and explore opportunities for sustainability and future cooperation within the wider CBRN preparedness community.

During the conference, speakers from eNOTICE-2 consortium highlighted the unique contribution of the project in addressing emerging operational challenges, particularly the decontamination of assistive devices used by people with disabilities. This topic generated a great interest, as participants emphasised the growing complexity of such devices, which are increasingly customised, technologically advanced, and made from materials that are vulnerable to usual decontamination procedures. The presentations emphasised that existing protocols are often inadequate and can cause irreversible damage, highlighting the need for updated guidelines and training approaches that enable operators to handle these devices safely and effectively. Building on this premise, the discussions also addressed the results of interviews conducted with people with disabilities and their representatives. The diversity of the sample, which included people with mobility, sensory, cognitive, or chronic health-related disabilities, illustrated the wide range of needs and vulnerabilities to be considered in CBRN emergency management.

The conference also saw the participation of representatives from DG ECHO rescEU and other EU-funded projects. The Roundtable discussion on the topic "Operational use of innovations, training to first responders, and Joint Activities in the CBRN TC Network – outcomes, challenges, and future" was moderated by UCLouvain and involved speakers representing projects eNOVATION, TeamUP, CBRNe4Rail, DIREKTION, IMPRESS, GUARDIANS, MOBVEC, P106 and others, who contributed to discussions on the CBRN training results and operational challenges, bringing innovations to first responders, synergies between programs and the sustainability of results beyond the conclusion of the project.

Updates on CBRN capacity development in several Member States, including Italy, Germany, Finland, and Croatia, provided an operational overview of how European tools and guidelines can support coordinated response mechanisms. Particular attention was paid to the evolving role of immersive technologies in CBRN preparedness, notably VR and AR solutions, recognised for their potential to support standardised and highly realistic training environments. A recurring theme in the discussions was the need to refine and harmonise procedures for managing events with a high number of victims especially when vulnerable people are involved. Participants recognised that ensuring the rapid identification of people who need

specific support, particularly those who use assistive devices, is critical to maintaining efficient response flows. Several speakers reflected on the fact that preparedness measures must nevertheless consider a wide range of situations and ensure that first responders are equipped with the knowledge and awareness necessary to act in a timely and appropriate manner.

Overall, the Final Conference represented both the culmination of the work carried out within eNOTICE-2 and a strategic forum for future planning. By facilitating dialogue between practitioners, researchers, and policymakers, the event strengthened the link between training, innovation, and operational preparedness. It also reaffirmed the centrality of inclusivity, and technological advancement in future CBRN preparedness efforts, ensuring that the results of eNOTICE-2 will continue to support the resilience of European emergency response systems for years to come.

Agenda 27th November 2025: Final Conference at Conference Room of Rocca Sveva, Soave (VR)

Time	Session	Speakers
9:00 – 9:30	<i>Welcome coffee and registration</i>	
9:30 – 9:45	Welcome remarks and overview of the project	Olga Vybornova, UCLouvain
9:45 – 9:55	Introduction by eNOTICE-2 Project Officer	Teresa Capula, DG ECHO (online)
9:55 – 10:20	<i>Keynote speech focusing on the relevance of an effective response to CBRN emergencies.</i>	Speaker(s) tbd
Session 1 - eNOTICE-2 project key results and recommendations		
10.20 – 10:40	CBRN priority topics, training courses, and library of resources	Daniele Di Giovanni, Gabriele Giuga, UNITOV
10:40 – 11:00	Additional Information on Scene, synthetic operational information about biological agents for first responders	Thomas Van Den Bosch, VESTA
11:00 – 11:30	<i>Coffee break</i>	
Session 2 – Continuation of eNOTICE-2 key project results and recommendations		
11:30 – 12:30	Methods and results of decontamination of assistive devices, guidelines for first responders	Matthias Haack, FDDO Jean-Luc Gala, UCLouvain
12:30 – 12:50	Physical and psychological requirements of people with disabilities during CBRN decontamination	Marie Dauvrin, UCLouvain (online)
12:50 – 13:00	Q&A	
13:00 - 14:00	<i>Lunch hosted</i>	
14:00 – 14:20	Key outcomes of the eNOTICE-2 SimEx4	Fondazione SAFE

14.20 – 14.30	Highlight of eNOTICE-2 results and their impact on the CBRN preparedness in the future – 10 min	UCLouvain and DG ECHO (Ida Cosentino)
14:30 – 15:50	Roundtable discussion: Operational use of innovations, training to first responders, and Joint Activities in the CBRN TC Network – outcomes, challenges, and future ▪ The role of rescEU: Update on CBRN capacities development (Italy, Germany, Croatia) ▪ Katerina Valouma (TeamUP) ▪ Grigore Havarneanu (CBRNe4Rail) ▪ Ives Van Haute (eNOVATION) ▪ Bastien Caillard (DIREKTION)	
15:50 – 16:00	Conclusions and closing remarks	UCLouvain
16:00 – 17:00	<i>Networking cocktail</i>	





Figure 14 Final Conference presentations

3.3.1 Conclusions

The Final Conference marked the successful conclusion of the eNOTICE-2 project, serving both as an opportunity to consolidate the results achieved and as a strategic forum for reflection on future CBRN preparedness needs at European level. Discussions confirmed the strong relevance and added value of the project in addressing emerging operational challenges, particularly those related to the decontamination of assistive devices used by people with disabilities. The conference emphasised the importance of placing vulnerable populations at the center of CBRN emergency planning, taking into account the diversity of disabilities and the complexity of associated assistive technologies. Information collected from interviews with individuals with disabilities and their representatives reinforced the need for inclusive, evidence-based guidelines and training approaches that reflect real-world operational limitations and user needs. Participants agreed that improving the awareness, preparedness, and decision-making capacity of first responders is essential to ensuring an effective and dignified emergency response.

In addition, the event highlighted the value of cooperation between programs and knowledge sharing between EU-funded initiatives. The exchange of national experiences and capacity building demonstrated how European tools and shared guidelines can strengthen cooperation. There was particular agreement on the growing role of immersive technologies, such as virtual reality and augmented reality, as enablers of more realistic and standardised training solutions. In conclusion, the final conference reaffirmed the importance of continued collaboration between researchers, policymakers and first responders to ensure the sustainability and uptake of eNOTICE-2's results. By linking innovation, training, and operational practice, the conference confirmed that the project's results provide a solid base for improving CBRN preparedness across Europe in the long term.

4 Conclusions and way forwards

The final Simulation Exercise and Final Conference marked the culmination of the eNOTICE-2 project, demonstrating concrete improvements in Europe's ability to respond to large-scale, cross-border CBRN events. The exercise confirmed the effectiveness of standardised detection, sampling, and decontamination protocols, while underlining the critical need for clear coordination among multiple agencies and countries.

A key lesson learned from the exercise was the importance of responding to the needs of vulnerable populations, particularly with regard to assistive technologies. The successful integration of virtual reality-based training demonstrated the potential of immersive simulation to improve preparedness, strengthen interagency collaboration, and enhance decision-making in stressful and complex scenarios. Feedback from participants highlighted that inclusive procedures and realistic training are essential for operational readiness.

The exercise also reinforced the value of joint training, structured observation, and continuous knowledge sharing. Recommendations from the event underscore the need for continuous updates to emergency guidelines, further refinement of evacuation and decontamination protocols, and ongoing investment in collaborative training activities across Europe.

Finally, the eNOTICE-2 final exercise not only validated the project's objectives but also provided a solid foundation for future capacity-building efforts, ensuring that European first responders and civil protection agencies are better equipped to manage CBRN threats in a coordinated, effective, and inclusive manner. The legacy of the project lies in its contribution to operational cohesion, innovation in training, and the creation of a resilient cross-border network dedicated to CBRN preparedness.

Annex 1

Agenda of the Final SimEx

Final Agenda

eNOTICE-2 project Final CBRN SimEx and Final Conference

Agenda 26th November 2025: Final TTX at Baita Calvarina

Time	Session	
9:00 – 9:30	Transfer from Soave to Baita Calvarina	
9:30 – 10:00	Introduction to the TTX: CBRN emergency response in the context of Paralympic Games including rescEU capacities	
10:00 – 12:15	Implementation of the TTX	
12:15 – 13:00	De-briefing and questionnaire	
13:00 – 14:00	Social Lunch hosted	
14:00 – 14.30	Transfer to Calvarina base	
Showcase of SAFE immersive technology for training activities		
14:30 – 16:30	Showcase of rescEU-CBRN-DSIM-IT's TTX AR Software	Testing VR Demos designed by SAFE and METU
16:30 – 17:00	Transfer back to Soave	
19:30	Social Dinner (restaurant to be confirmed)	

Agenda 27th November 2025: Final Conference at Conference Room of Rocca Sveva, Soave (VR)

<i>Time</i>	<i>Session</i>	<i>Speakers</i>
9:00 – 9:30	<i>Welcome coffee and registration</i>	
9:30 – 9:45	Welcome remarks and overview of the project	Olga Vybornova, UCLouvain
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15:50 – 16:00	Conclusions and closing remarks	UCLouvain
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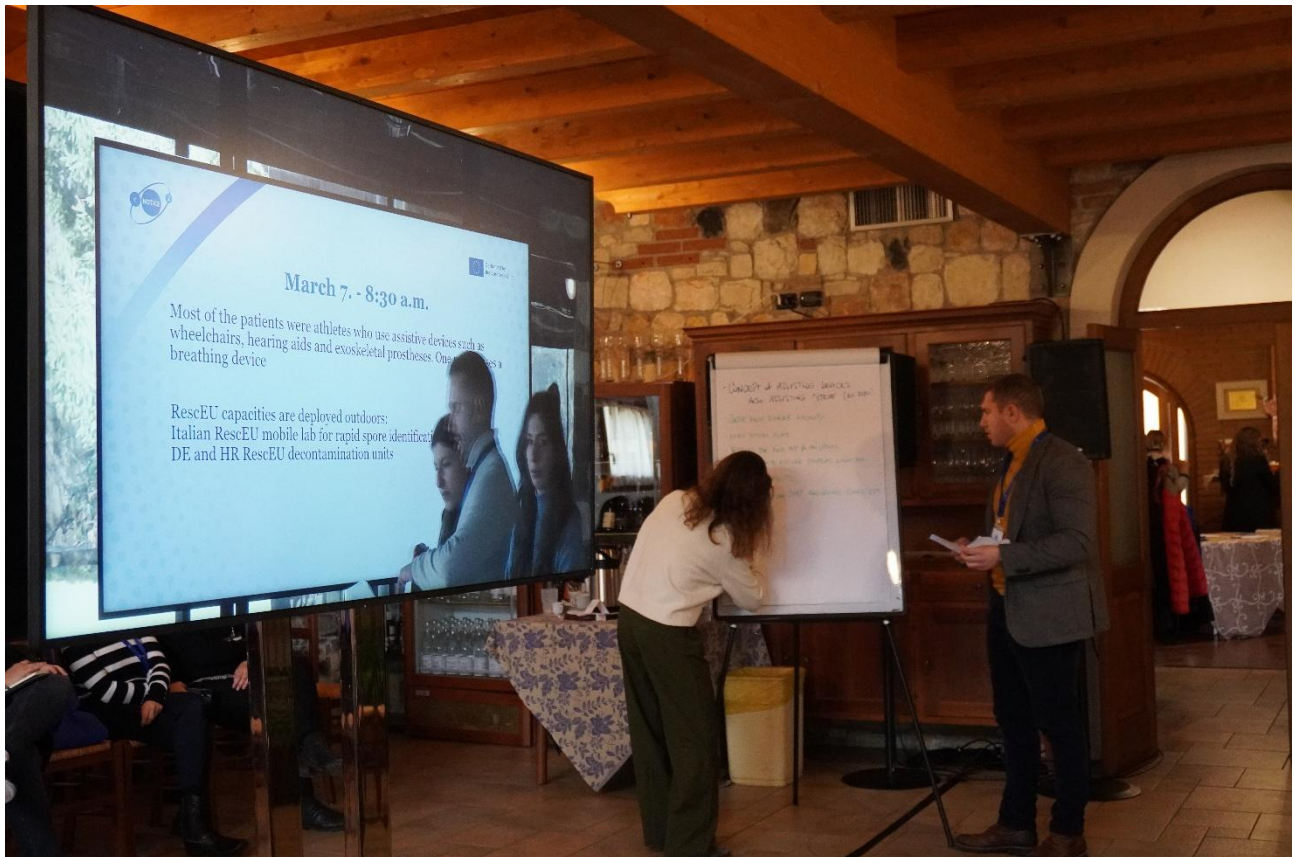
ANNEX 2

Pictures From The Final Simex

eNOTICE-2 Final CBRN SIMEX and Final Conference Day 1 – 26th November



D4.2 Final CBRN SimEx (PU)











D4.2 Final CBRN SIMLEX (F.O.)



Day 2 – 27th November







ANNEX 3

Reporting Checklist

Preparation/organization

D4.2 Final CBRN SimEx (PU)

a. Context and Objectives

Organising partner: Organizing partner: Fondazione SAFE organized the final exercise (TTX) on November 26, 2025, in Roncà (Verona, Italy) and the final conference on November 27, 2025, in Soave (Verona, Italy). The main objective of the final TTX was to train first responders on the decontamination of vulnerable people and their assistive devices from hazardous substances. In addition, the final TTX aimed to gather all general feedback from previous theoretical exercises and finalize the CBRN guidelines on decontamination.

b. Communication and dissemination strategies

	Very un-successful										Very successful
1. In your opinion, to what extent were you successful in communicating your expectations to the participants?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☒	10 ☐	

Please explain your answer:

Communication with participants before to the event was by identifying the most appropriate channels. Participants were given all the necessary information in relevant time, including how to get to the TTX location, the agenda, and information about the TTX itself.

1. What means of (active / passive) communication to the participants did you use?

- ☒ E-mail
- ☒ Teleconference tools
- ☐ Newsletters
- ☒ Own website
- ☒ eNOTICE platform
- ☐ Verbal briefing
- ☐ Other (please specify): Enter text here

2. How did you disseminate the JA to external organisations?

- ☒ Via the eNOTICE platform
- ☒ Via e-mail to the attendants
- ☐ Via own website
- ☐ Via social media

- ☐ Via press/ traditional media
- ☐ Other (please specify): Enter text here

3. *To what extent was your dissemination strategy influenced by the joint aspect?*

It was necessary to agree on the provided information (in the context of dissemination with all partners and participating projects), to guarantee that the forwarded information is in line between the responsible / appropriate key-players.

c. *Difficulties encountered during the preparation/organization phase.*

The organization of the TTX involved several levels of complexity. First, the venue was designed to enable a full learning experience for both active players and observers. This requirement introduced several technical challenges during the setup of the event.

d. *Which were applicable Security/legal/ethical aspects encountered during the preparation/organisation phase? (See Annex I for complete checklist)*

- ☒ E.g. informed consent
- ☒ E.g. gender considerations, if applicable in line with the EU' s policy
- ☐ E.g. religious considerations, if applicable in line with the EU's policy
- ☐ Other (Please specify) Klik of tik om tekst in te voeren.

2. The JA conduction

e. *Practical information (upload the general information sheet to answer some these questions)*

1. Place, time, date, etc.

26th November – Baita Calvarina Roncà (Verona – Italy)

Time	Session
9:00 – 9:30	Transfer from Soave to Baita Calvarina
9:30 – 10:00	Introduction to the TTX: CBRN emergency response in the context of Paralympic Games including rescEU capacities
10:00 – 12:15	Implementation of the TTX
12:15 – 13:00	De-briefing and questionnaire

2. Participants description

- a. Number of participants : 32 active participants
- b. Which organisations do the participants represent?

Participants represented a variety of organizations including:

- Civil protection
- Firefighters
- National Police
- Hospitals and biological research centres
- Universities
- Private firms
- European Institutions
- Municipalities
- National Army

3. Agenda

Time	Session	
9:00 – 9:30	Transfer from Soave to Baita Calvarina	
9:30 – 10:00	Introduction to the TTX: CBRN emergency response in the context of Paralympic Games including rescEU capacities	
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16:30 – 17:00	Transfer back to Soave	
19:30	Social Dinner (restaurant to be confirmed)	

4. Scenario of the exercise/table top/event, in order to provide context information, if applicable

The Final SimEx scenario was developed as a continuation of the TTX conducted in Ranst (Belgium, June 2025), ensuring consistency with the integrated and iterative approach of the eNOTICE-2 project. It simulated a deliberate biological attack during the 2026 Winter Paralympic Games in Italy, involving the release of *Bacillus anthracis* spores at a dinner in the Paralympic Village. The incident affected approximately 200 individuals, including athletes and accompanying persons, and was detected following the onset of symptoms the next day. Participants were required to manage the full response cycle, including recognition of the biological threat, sampling and laboratory analysis, and the implementation of appropriate

decontamination measures. Particular emphasis was placed on the decontamination of assistive technologies used by athletes with disabilities, under challenging winter conditions. The exercise provided a realistic framework to assess interagency coordination, technical decision-making and multinational interoperability in response to a complex biological emergency affecting a major international event.

5. *What is the add on that made it JA (see fig 4)?*

a. *Describe briefly the original event, the extra element and the overlap between those (Joint aspect)*

The activity overlapped with the project RescEU CBRN DSIM IT. The scenario simulated a Bio emergency during the Paralympic Games and the deployment of the resceu capacity from Italy, Germany, Croatia and Finland.

b. *Which parts are covered by external partners?*

None

To what extent did the joint aspect influence the scenario (if applicable)?

Enter text here

f. *Were there any extra briefings because of the JA?*

Only an integration in the injects providing more information on the resceu capacity

g. *If suspension (unplanned): why?*

N.A.

h. *Did any external events have an effect on the conduction of the JA? (e.g. COVID-19)*

N.A.

i. *Security/legal/ethical aspects encountered?*

3. The evaluation

6. What debrief/evaluation sessions did you host?

☒ Hot debrief

☐ Cold debrief

☐ Other Enter text here

1. *Was there enough time for the evaluation sessions of the JA? Why (not)?*

Yes time was enough and it gave also time to make a comparison between the TTX 3 implemented in Ranst and the one being developed in Soave.

j. **Reflection on objectives and lessons identified**

2. Cost efficiency

a. Leading questions:

b. *Where were extra resources needed, and where could resources be combined?*

No extra funds were necessary for the action

c. *Were more resources needed, or less in comparison with if the original exercise and the joint aspect (fig 4.) would have been separated?*

Not

3. Human resources

a. *Number of person-months (person hours/ FTE's per month/ human effort/ employee months) for JA organisation and duration, if applicable.*

The total number of person months (including organisation and implementation): 6,66 person months from September to November 2025.

b. *Which actors were involved?*

Project managers and communication officers.

4. *Material resources (JA only)*

a. *Which material resources did you use for the JA? Fill in where relevant, see below.*

b. *Were this extra resources needed for the JA or was it combined (Extra/Combined)? See below.*

c. *Where the resources owned by the TC or from external parties? See below.*

<u>Accommodation</u>	<u>Extra/combined</u>	<u>Own/not own</u>
☐ Tents	☐ Extra	☐ Own
	☐ Combined	☐ Not Own

☒ (hotel) rooms	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Other enter text here	☐ Extra	☐ Own
	☐ Combined	☐ Not Own

<u>Transport</u>	<u>Extra/combined</u>	<u>Own/not own</u>
☒ Shuttle bus	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Other enter text here	☐ Extra	☐ Own
	☐ Combined	☐ Not Own

<u>Food</u>	<u>Extra/combined</u>	<u>Own/not own</u>
☒ Drinks	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☒ Lunch	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Dinner	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Other enter text here	☐ Extra	☐ Own
	☐ Combined	☐ Not Own

<u>Safety</u>	<u>Extra/combined</u>	<u>Own/not own</u>
☐ Traffic signs	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☒ Badges	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Demarcation ribbon	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Whistles	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Fire extinguishers	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Other enter text here	☐ Extra	☐ Own
	☐ Combined	☐ Not Own

<u>Recording/dissemination</u>	<u>Extra/combined</u>	<u>Own/not own</u>
☒ Cameras/webcams	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Audio recorders	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Headphones	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Other enter text here	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
<u>Locations</u>	<u>Extra/combined</u>	<u>Own/not own</u>
☐ Auditorium/lecture hall	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ (Class)rooms	☐ Extra	☐ Own
	☐ Combined	☐ Not Own
☐ Other enter text here	☐ Extra	☐ Own
	☐ Combined	☐ Not Own

Other: Enter text here

7. Financial resources (estimations)

a. What were the total material costs of the JA?

The total costs included the venue, photographer, catering, video and audio equipment, transfers, and the consultant for scenario design 12.677,00

b. How was the eNOTICE 2 budget split?

100% Enotice2 budget split

c. Was the project budget sufficient?

ii. Explain why/why not

The planned resources were sufficient thanks to a well-implemented financial monitoring activity.

iii. Mutual benefits

8. Elaborate on the mutual benefits for both collaborating organisations and participants:

D4.2 Final CBRN SimEx (PU)

a. For the organising TC and for the Joint aspect

The collaboration was mutually beneficial for both the organising TC and the joint partners, as well as for all participants. Conducting the activity in person significantly enhanced engagement, trust, and real-time collaboration, allowing for more effective communication and faster decision-making compared to remote formats. The tabletop exercise (TTX) generated strong and constructive discussions, which enabled participants to share perspectives openly and led to the emergence of innovative solutions, particularly through the integration of rescue capacities across organisations. Furthermore, the joint debriefing proved highly valuable, as it allowed participants to identify common elements with previous TTXs while also highlighting the specific and unique aspects of the final exercise. This collective reflection strengthened shared understanding, interoperability, and future coordination among all involved organisations.

b. For the TC's of the network

Participants benefited from the opportunity to work closely together, fostering collaboration across organisations and disciplines. This practical interaction enabled them to develop concrete reflections that went beyond the theoretical framework applied in the project. By engaging directly with realistic scenarios and shared challenges, participants were able to translate theory into actionable insights, enhance mutual understanding of roles and procedures, and identify practical improvements applicable to real operational contexts.

9. *Elaborate on the mutual benefits for other attending parties (if applicable)? (0=no benefit, 10= great benefit), and explain your answer:*

a. Industry

	No benefit									Great benefit
1. industry	1 ☒	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
Please explain your answer	Enter text here									
2. External training centres and training professionals	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☒	9 ☐	10 ☐
Please explain your answer	Enter text here									
3. EU and national projects	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☒	9 ☐	10 ☐
Please explain your answer	Joint activity implemented with resceu Italy, Croatia, and Germany									
4. Policy makers	1 ☒	2 ☒	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐

Please explain your answer	Enter text here									
5. Organisers	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☒	10 ☐
Please explain your answer	Enter text here									

b. Elaborate on the societal increased benefits of this JA?

The Ja increase coordination on large scale events and reflections on the use of European capacity.

At a societal level, the Joint Activity (JA) generated increased benefits by enabling first responders to collectively discuss and identify areas for improvement in the implementation of mass decontamination operations. In concrete terms, this included reflecting on potential risks and mitigating actions related to decontamination assistive devices, considering the geographic scope and complexity of large-scale emergency scenarios, and strengthening coordination with available rescue capacities. By addressing these operational challenges in a collaborative and practical setting, first responders enhanced their ability to operate more efficiently and safely. Ultimately, this improved preparedness and interoperability contribute to a broader societal advantage, as more effective emergency response capabilities lead to increased public safety, resilience, and trust in crisis management systems.

c. What were the mutual lessons identified?

Mutual lessons were mainly on the high level of cooperation and concrete elements provided by resceu.

10. To what extent were your expectations met in terms of

a. Attendance of participants?

The expectations were fulfilled

b. Contributions of participants?

All participants, both active players and observers made fruitful and deep discussions on the scenario created.

11. Please elaborate on whether your other objectives (if any) met in this JA?

NA

k. Utility of templates/reporting checklist

- a. What templates were used from the project, and what own templates were used (if applicable)?

- ☒ Informed consent form
- ☐ General information sheet
- ☐ Observer's protocol
- ☐ Objectives, expected results and evaluation criteria
- ☒ Logistic requirements
- ☒ Exercise roles and responsibilities
- ☒ Preparation and organisation
- ☒ Communication about the exercise
- ☐ Observer's protocol
- ☐ Cost evaluation sheet
- ☐ Evaluation and debriefing forms (new form)
- ☐ Example of follow up
- ☐ Specific actions/ area of attention for JOINT activities
- ☐ Legal/ethical/security checklist
- ☐ Example of a registration form for external participants

- b. Please provide feedback on the project templates, if you used them (answer per used template).

1. *Ease of use (0=very difficult to use, 10= very easy to use)*
2. *Clarity of the template (0= not clear at all, 10=very clear)*
3. *Usefulness of the template (0= not useful at all, 10=very useful)*
4. *do you have any additions to the project template?*

...

Informed consent form	Not (...) at all									extremely (...)
Easy to use	1 ☐	2 ☐	3 ☐	4 ☒	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐
Clarity of the template	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☒	7 ☐	8 ☐	9 ☐	10 ☐
Usefulness of the template	1 ☐	2 ☐	3 ☐	4 ☐	5 ☒	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐

Do you have any additions to the project template?

Enter text here

12. Were you satisfied with the reporting checklist?

☒ Yes

☐ No

13. Please explain your answer

The list includes all the key elements required to ensure the smooth organisation and implementation of the Joint Activity.

1. Any other aspects that were not addressed in the reporting checklist?

Enter text here

ANNEX 4

VR scenario description

Introduction to the VR Project

“Dry Decontamination with VHP System”

The main purpose of the virtual reality (VR) application designed by Fondazione SAFE is to provide an effective training tool for the use of a decontamination system by simulating a VHP (Vaporized Hydrogen Peroxide) decontamination process (i.e., dry decontamination). The aim is for VR trainees to configure the DECON environment, monitor the main physical parameters (humidity, temperature, volume of the containment area), and initiate the VHP decontamination process remotely. Different from the Wet DECON, once launched, the entire procedure runs without personnel inside the tent. In alignment with the key objectives of the eNOTICE-2 project, the focus is on the decontamination of electronic devices and, in particular, electronic assistive devices of vulnerable groups. The application is structured around 4 different scenarios with an increasing level of complexity. Therefore, the application is structured to allow intuitive and dynamic learning, offering the possibility to expand scenarios and training tasks based on future needs. The dynamic learning will be structured to allow an increasing level of complexity, reducing the guidance from the pop-up.

1. Structure of the VR Training Scenarios:

Overall, the VR experience will consist of four distinct scenarios (each one with an overall duration of 10-15 minutes), which increase their level of difficulty and complexity (e.g., varying the conditions such as temperature, room volume, etc.). The aim is to train the operator to handle different situations while using the VHP system by starting with a “Tutorial scenario”, which is followed by more complex scenarios. The following are the three levels of difficulty of the scenarios:

- **Step-by-step guided tutorial scenario:** This scenario provides detailed guidance with pop-ups, texts, and indicators to safely learn all the basic operational procedures for the use of the VHP system.
- **Intermediate scenario:** This scenario has limited assistance to encourage greater decision-making autonomy for operators, allowing potential errors to promote skills consolidation and adaptability.
- **Advanced scenario:** This scenario is a guidance-free scenario. This scenario allows you to test your capacity to effectively use the VHP system.
- **Random scenario:** This scenario is a guidance-free scenario featuring randomly selected situations from multiple variations. This scenario allows you to test your capacity to effectively use the VHP system. The parameters and threats of the environment will be chosen from a pool made of 5 different scenarios. Intentional errors are also included, which the operator must identify and correct independently, testing decision-making skills and responsiveness. This scenario will present a higher level of challenge to further enhance realism and training quality. It will include the following challenges:
 - Verification of airtight sealing of containers and objects.
 - Introduction of intentional errors (incorrect parameters, mispositioned items) to assess and improve operators' diagnostic and corrective skills.

2. Key Features of the Application:

- **Interoperability:** Simultaneous collaboration between multiple operators within the same virtual environment, replicating realistic field conditions.

3. Simulated Procedure:

The VR scenario, excluding the Random one, will have a predefined threat well-known to the trainees.

The VR application will simulate the following operational steps:

- 1. Define the target**
- 2. Initial tent preparation:**
 - Inflation of the outer tent.
 - Placement of the inner tent (bubble).
 - Insertion of heater and fans, contaminated items, biological and chemical control indicators.
 - Placement of the VHP device and related sensor.
 - Insertion of the VHP container into the VHP system.
 - First monitoring of the key physical parameters
- 3. Positioning and verification of objects:**
 - Correct placement of the contaminated items.
- 4. Cleamix configuration:**
 - Closing of the tents.
 - Setting operational parameters (temperature, H₂O₂ saturation limit, duration, room volume, etc.) via remote controller.
- 5. Cycle start and monitoring:**
 - Monitoring set parameters and final verification via hydrogen peroxide indicator tape.
 - Option to skip the waiting phase.
 - Error reporting via Drager X-am 5100 device with possible procedure repetition.
 - Check the Drager X-am 5100 results (positive or negative).
- 6. Conclusion:**
 - If the results are positive, remove decontaminated items.
 - If the results are negative, restart the procedure.