



Funded by
the European Union

resceU CBRN-DSIM-IT

AT THE FOREFRONT TO PROTECT CITIZENS,
INFRASTRUCTURE AND THE ENVIRONMENT

A CONSORTIUM OF ITALIAN EXCELLENCE



Fondazione SAFE

rescEU-CBRN-DSIM-IT

Call for proposals for the creation of three XR Scenarios

Context and introduction:

European Union Member States increasingly face events that threaten public safety and critical infrastructure security, including Chemical, Biological, Radiological, and Nuclear (CBRN) incidents. These events significantly disrupt essential services, public movement, and safety, causing substantial economic and psychological effects. In response, the EU has prioritized CBRN protection over the past decade, launching initiatives to strengthen national and regional CBRN governance and capabilities, with a particular emphasis on safeguarding public spaces and Critical Infrastructures (CIs) vital for societal functions and well-being.

Governments now recognize that public spaces, high-profile events, and infrastructures are interconnected, with vulnerabilities in one area potentially triggering cascading impacts. Prevention is key, but in the case of CBRN incidents, effective mitigation and recovery strategies are crucial to protect lives, the environment, and to contain the affected area. This has prompted EU Member and Participating States to enhance preparedness for cross-border CBRN disasters and emergencies. Against this background, the rescEU-CBRN-DSIM-IT project is a key initiative focusing on enhancing the EU's ability to prevent and respond to CBRN emergencies. This project is dedicated to developing advanced Detection, Sampling, Identification, and Monitoring (DSIM) capabilities for CBRN incidents. The newly created capability will be operated by firefighters, along with specialists coming from civil protection and scientists assigned by relevant public entities.

At its core, the project involves the creation of a specialized modular capacity to be deployed in the context of large-scale events, both for preventive and response actions. This modular, integrated capacity will consist of 11 vehicles, including one DSM Vehicle equipped with state-of-the-art technology for rapid and effective detection and monitoring; four Mobile Laboratories for sampling and analysis of Chemical, Biological, and Radiological/Nuclear agents and sources; five support and logistics vehicles providing equipment for operators; and a dedicated vehicle for innovative training of operators through Extended Reality (XR) technology. The creation of this modular capacity will be complemented by the definition of dedicated infrastructures for the storage of the capacity and training of its operators, with a defined roster of personnel ready for deployment. rescEU-CBRN-DSIM-IT is funded under the Union Civil Protection Mechanism program, with Grant Agreement (GA) 101122710 — rescEU-CBRN-DSIM-IT — UCPM-2022-rescEUCBRN-IBA.



PART 1- Call requirements

In the context of the augmented and virtual reality capabilities to be developed within the project, a central role is played by the ability to deliver XR training scenarios. The aim of the training is to train operators and technical experts on response capacities in a CBRN context in a simulated operational scenario of high complexity through the use of XR. These specific scenarios are expected to focus on:

1. Chemical Security Incident XR Training Scenario (Emergency Response) - A chemical security incident involving the large-scale deliberate release of a chemical agent in a public place, such as a stadium.
2. Nuclear Power Plant Emergency XR Training Scenario (Emergency Response) - A nuclear power plant emergency involving the accidental or deliberate release of a radiological agent affecting a urban environment.
3. Biological Security Incident XR Training Scenario (Emergency Response) - A biological security incident involving a deliberate attack with a biological agent in a public place.

Participants are expected to train in a simulated scenario that involves interaction with real-life components of the rescEU-CBRN-DSIM-IT capacity.

Eligibility criteria

The following criteria will be applied to all candidates. The call is open only to single operators; consortia composed of more than one operator are not to be considered eligible. The candidate must possess all requirements and no subcontracting (even partial) is allowed.

1) Financial:

- a) The average annual turnover of the candidate for the last 2 years must exceed 1 000 000 EUR; and
- b) Current ratio (current assets/current liabilities) in the last 2 years for which accounts have been closed must be at least 1.

2) Technical: The reference period is to the three years prior to the submission deadline.

- a) The candidate has adequate staff dedicated to the conduction of the project, including, *inter alia*:
 - i) Project Coordinator
 - ii) Developers (both frontend and backend).
 - iii) 3D artists and environmental artist.
 - iv) Cybersecurity expert
- b) The candidate has documented experience in the development of solutions in Virtual and Extended Reality.
- c) The candidate has documented experience in the development of 3D objects and 3D environments.
- d) The candidate has participated at least to two projects in fields relevant for the project (XR applications for emergency response, CBRN, firefighters, etc...), that match with the following requisites:
 - i) Minimum overall contract value: 300.000€
 - ii) In case of projects implemented by a consortium: the portion that was carried out within the project by the candidate must be equal at least to 30% of the project overall value OR €200.000 (for ongoing projects, only the portion of budget/activities completed at the date of application are to be considered eligible), whichever is higher.
 - iii) At least 1 project/contract as a sole contractor – not as a member of a consortium.
- e) The candidate is capable of complying with NIS2 requirements in the delivered solutions.



3) Exclusion Criteria: candidates shall confirm that they do not fall in any of the exclusion criteria listed below:

- a) The candidate is bankrupt, subject to insolvency or winding-up procedures, where its assets are being administered by a liquidator or by a court, or it has entered an arrangement with its creditors, where its business activities are suspended, or it is in any analogous situation arising from a similar procedure provided for under national laws or regulations;
- b) It has been established by a final judgment or a final administrative decision that the candidate is in breach of its obligations relating to the payment of taxes or social security contributions in accordance with the law of the country in which it is established, with those of the country in which the contracting authority is located or those of the country of the performance of the contract; (c) it has been established by a final judgment or a final administrative decision that the candidate is guilty of grave professional misconduct for having violated applicable laws or regulations or ethical standards of its profession, or for having engaged in any wrongful conduct which has an impact on its professional credibility and implies wrongful intent or gross negligence, including, by way of example, any of the following:
 - i) fraudulent or negligent misrepresentation of information required to verify the absence of grounds for exclusion or the fulfilment of selection criteria or in the performance of a contract;
 - ii) execution of an agreement with other economic operators with the aim of distorting competition;
 - iii) violation of intellectual property rights;
 - iv) attempt to influence the decision-making process of SAFE during the procurement procedure;
 - v) attempt to obtain confidential information that may confer upon it undue advantages in the procurement procedure;
- c) It has been established by a final judgment that the candidate is guilty of any of the following:
 - i) fraud, within the meaning of Article 1 of the Convention on the protection of the European Communities' financial interests, drawn up by the Council Act of 26 July 1995;
 - ii) active corruption, as defined in Article 3 of the Convention on the fight against corruption involving officials of the European Communities or officials of Member States of the European Union, drawn up by the Council Act of 26 May 1997, and in Article 2(1)(a) of Council Framework Decision 2003/568/JHA, as well as corruption as defined in the law of the country where the contracting entity is located, the country in which the candidate is established or the country of the performance of the contract;
 - iii) participation in a criminal organization, as defined in Articles 1 and 2 of Council Framework Decision 2008/841/JHA;
 - iv) money laundering or terrorist financing, as defined in Article 1(3), (4) and (5) of Directive (EU) 2015/849 of the European Parliament and of the Council;
 - v) terrorist-related offences or offences linked to terrorist activities, as defined in Articles 3 and 4 and in Title III of Directive (EU) 2017/541 of the European Parliament and of the Council, respectively, or inciting, aiding, abetting or attempting to commit such offences, as referred to in Article 14 of that Directive;
 - vi) child labour or other forms of trafficking in human beings as defined in Articles 2 and 3 of Directive 2011/36/EU of the European Parliament and of the Council;
- d) The candidate has shown significant deficiencies in complying with main obligations in the performance of a contract financed by the budget, which has led to its early termination or to the application of liquidated damages or other contractual penalties, or which has been discovered following checks, audits or investigations by an authorizing officer, OLAF or the Court of Auditors;



- e) It has been established by a final judgment or final administrative decision that the candidate has committed an irregularity within the meaning of Article 1(2) of Council Regulation (EC, Euratom) 2988/95.

Contract details

Maximum Budget:

- Maximum estimated contract value: €200,000 VAT excluded. This budget refers only to the services to be carried out by the contractor to develop and deliver the XR scenarios, and does not include hardware costs that SAFE will have to undertake to ensure full functionality of the delivered solution. Proposals are required to outline, separately from the budget for services, an estimate of hardware features and related costs - only the pricing of services will be taken into consideration to assign the score to the financial proposal, while the estimate of hardware costs will be utilized as internal evaluation tool for potential hardware procurement.

Timeline for project implementation:

- Deadline for requesting clarifications: 09/12/2024
- Deadline for presentation of proposals: 13/12/2024
- Contract signature and start of project: 8/01/2025
- Intermediate monitoring: 31/03/2025
- Project completion date: 31/07/2025

Award Criteria and execution of contract

- Best price-quality ratio, with 80% of the overall score assigned to technical quality and the remaining 20% to financial proposal.
- The selected candidate will be informed by email and will be invited to a negotiation phase to define the final technical and financial features of the contract.
- In case of successful completion of the negotiation phase, an award notice will be sent to the selected candidate. Formal confirmation of acceptance of the contract must be given within 5 working days from the award letter. Confirmation received after the 5 working days may result in the exclusion from the award unless duly justified.

IP Rights

- All right title and interest in and to the Intellectual Property Rights related to the XR scenarios resulting from the completion of the Project and to their use and commercialization in any possible way and combination to the maximum extent and duration permitted by the Italian law shall ipso facto vest solely in Fondazione SAFE.

Application format and details to be provided

The candidates must submit applications via electronic format at safe@safe-europe.eu – no other means of submission will be accepted. Applications must contain:



- Technical proposal: it is a presentation of the proposal idea in PPT/PDF format, providing the presentation of the candidate, general approach, methodology of delivery, proposed timeline with clear indication of milestones and indicative hardware proposal.
- Financial proposal: it outlines the pricing of the proposed solution, as well as an estimate of the hardware costs necessary to run the proposed solution. Only the pricing of services will be taken into consideration to assign the score to the financial proposal, while the estimate of hardware costs will be utilized as internal evaluation tool for potential hardware procurement.
- Documentary evidence of the technical and financial capacity, including a declaration of honour on the absence of exclusion criteria.

Any additional documentation (brochures, letters, etc.) sent along with an application will not be taken into consideration.

Alteration or withdrawal of applications

Candidates may alter or withdraw their applications by written notification prior to the deadline for submission of applications. No application may be altered after this deadline.

Upon submission of the application, each candidate will automatically confirm the validity of its technical and financial proposals for a period of 60 calendar days.



PART 2 – Technical requirements

General technical requirements of the XR scenarios

To meet a suggested initial list of desiderata from end-users, Fondazione SAFE intends to include the elements and interactions itemized below. The following list is tentative and will be adjusted with input and feedback collected from the entities directly involved in the training sessions to better meet the needs of the end-users. Thus, the list below must not be considered as final, as it lays out only indicative guidelines on the minimum requirements of the scenarios. Fondazione SAFE will provide, where possible, all supporting documentation (i.e. pictures, videos, technical sheets) of the 3D elements to be created. In addition, the storyboard will also provide the mechanics of specific actions and of the complex interactions between human agents, virtual characters and the virtual environment.

- **Training Platform:**
 - o Able to run on different devices and ensure interoperability;
 - o Standalone (i.e. offline) or cloud based, with pricing including perpetual license;
 - o Minimum 20 persons can connect simultaneously, in the same location or remotely - proposals providing a higher number of simultaneous connections will be prioritized;
 - o English Language with Italian translation;
 - o Participation of a live supervisor for all trainees as part of the XR experience;
 - o Availability of an advanced evaluation module, editable by trainers to select targets and KPI for each specific session (i.e.: it is necessary to implement the ability to modify the evaluation parameters for each scenario and for each trainee).
- **Hardware requirements**
 - o The candidates shall outline specific hardware requirements for the proposed SW solution, indicating technical details, origin and estimated costs of required HW. These costs will not be part of the financial evaluation and will be covered by SAFE through separate procurement procedure.
- **3D environment:**
 - o Simulation of an area equivalent to SAFE Calvarina base (see <https://www.google.com/maps/place/Fondazione+SAFE+-+Testing+and+Training+Area/> - approximate size 1 sq. km);
 - o Ability of trainees to move around within the entire area, remaining tracked (if needed, hardware requirements to ensure this tracking shall be listed in the proposal, including technical features and costs, as previously specified);
 - o At least three different environments shall be created, adhering to the size and structure of SAFE Calvarina base mentioned above, including:
 - A densely populated urban area,
 - A stadium,
 - A nuclear power plant.
- **Library of Vehicles, Personnel, and Objects (non-exhaustive list):**
 - o 3D models of vehicles part of the rescEU capacity (approximately 10 models in total, with animations);
 - o 3D models of mobile labs (1 model, with animations);
 - o 3D models of field facilities related to logistics support capability;



- 3D models of generic vehicles belonging to: fire brigades, police, emergency medical personnel, civil defence corps (approximately 15 models in total, with animations);
- 3D models of personnel from the fire brigades, police, civil defence corps, scientific personnel and medical personnel, as well as generic NPCs and NPC with AI;
- 3D model of a decontamination line and specific CBRN response elements;
- 3D models of assets to complement the rescEU capability in case of intervention, such as firefighting helicopters, K9 units (with animations);
- Simulation of crowd movements and actions.
- 3D environments (i.e. stadium, urban/rural areas, nuclear power plant).

Specific technical requirements for each scenario in the project

- A) **Scenario 1:** Chemical Incident XR Training Scenario (Emergency Response) - A chemical security incident involving the large-scale deliberate release of a chemical agent in a public place, such as a stadium.
- a. 3D environment of a stadium
 - b. Crowds linked to specific scenario
 - c. Specific Chemical related 3D items
 - d. 120 to 150 interactions foreseen (see next section)
- B) **Scenario 2:** Nuclear Power Plant Emergency XR Training Scenario (Emergency Response) - A nuclear power plant emergency involving the accidental or deliberate release of a radiological agent affecting an urban environment.
- a. 3D environment of a nuclear power plant/nuclear research plant and urban area located in its proximities
 - b. Specific NPC related to nuclear power plant personnel
 - c. Specific R/N related 3D items
 - d. 120 to 150 interactions foreseen (see next section)
- C) **Scenario 3:** Biological Security Incident XR Training Scenario (Emergency Response) - A biological security incident involving a deliberate attack with a biological agent in a public place.
- a. 3D environment of a selected public space
 - b. Animated crowds linked to specific scenario, including at least 5 NPCs with which trainees can actively interact and large crowds moving in the scenario, in a randomized manner
 - c. Specific R/N related 3D items
 - d. 120 to 150 interactions foreseen (see next section)

Training Specifics:

- Interactions and steps: Minimum 120 interactions will be described in each scenario storyboard (of which, approximately 80 simple and 40 complex interactions).
- Number of simultaneous players: Minimum 10 simultaneous players; capacity to develop up to 20 simultaneous players is considered an added value for the selection.
- Experience duration: Between 30 and 60 minutes.
- Location to be used in the environment: Fondazione SAFE Calvarina Testing and Training Area.



- Headsets: Quest 3, with the possibility for multi-platform (Open XR preferred).

Training Type: Extended Reality – the selected provider must integrate interactions with wearables (to be selected at a later stage) with a minimum integration of haptic gloves and armours. The capacity of integrating biometrics data collection is considered an added value for the selection. The exact number of integrations and complex interactions will be defined.

Performance Analysis: The candidate should integrate a performance assessment system capable of measuring performance through the XR training. The minimum requirements should include a self-generated report, ideally based on AI, capable of capturing and measuring the performance of completed actions, mapping movements of the trainees individually and as a whole and understanding and measuring if the trainees have been carefully observing all elements in the scenario.

All scenario must feature:

- The scenarios should include the selection of the type of threat: Chemical, Biological, and Radiological/Nuclear (RN).
- NPCs should be included, ideally with AI integration for crowd movement simulations
- NPC interactions: Minimum 5.

Scenarios should be operational as follows:

- Standalone Multiplayer.
- Online Multiplayer.
- Single Player.

Features to be integrated:

- Hand Tracking.
- Motion Tracking (if an external tracking system is required, this should be highlighted at the EOI stage).
- Freedom of movement in a 1 sq. km area.
- Automatic Reporting and Performance Measurement system, which can be tailored by trainers to select specific KPIs for specific training sessions.

A map of the environment based on the whole Calvarina Testing and Training Area (both indoors and outdoors) will be provided. An aerial view is available [here](#), and a walkthrough of the environment will be provided upon request. Focus and attention should be given to Chemical (same environment replicated for Biological) and Radiological/Nuclear scenarios. As a general outline, the Chemical/Biological scenario environment should ideally replicate a stadium and its surroundings. The Radiological/Nuclear scenario should replicate a nuclear facility incident.