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## LIFE SECURDOMINO

### Seveso sites: assessment of integrated safety-security hazards and risks and related domino effects.

Period of implementation: 2021-2025



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## Background:

Chemical and process plants, energy facilities, oil and gas installations and industrial facilities are the potential target of physical and cyber-attacks. These may trigger cascading 'domino' effects such as the release of flammable, explosive, toxic or noxious substances into the environment and accidents in other areas of the plant not initially attacked.

Security-related threats could affect coasts, rivers, lakes and densely populated areas at regional and national scale. The Major Accident Reporting System reported 557 accidents in EU for the period 1990-2020; 23 of these accidents resulted in domino effects causing €1.1 billion of damages and €3.2 million of environmental damage. The European Program for Critical Infrastructure Protection promotes the prevention, preparedness and response to terrorist attacks to energy and transport installations. The European Seveso-III Directive (2012/18/EU) asks for an assessment of the domino effects focusing on safety and related issues.



LIFE SECURDOMINO innovates and improves plant inspection practices, bringing to an optimized monitoring of Safety/Security aspects in Seveso establishments and, consequently, bringing significant benefits to environment and resident population.

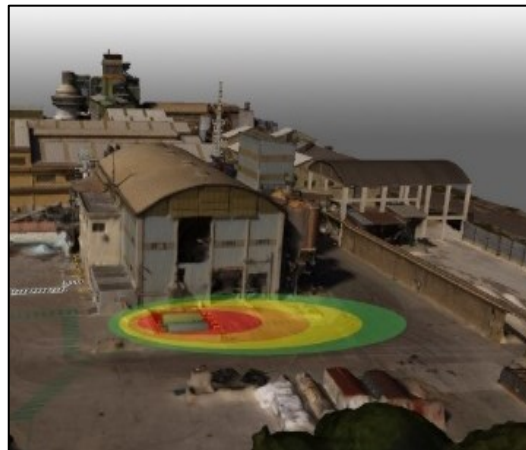
## Actions:

- Tool development : Integrated safety/security assessment of hazard and risks and related domino effects in Seveso sites.
- Tool parallel testing in 3 industrial DEMO sites : Costieri D'Alesio (Livorno, Italy), Bolton Group (Manetti & Roberts) (Calenzano, Italy), Wilhelmsen Ships Service (Rotterdam, The Netherlands)
- Improvement of the safety-security aspects: DEMO sites vulnerability and risk will be reduced through the tool application improving the safety-security status.

## Results:

The tool consists of: a) plant inspection by aerial photogrammetry drone; b) 3D reconstruction of the plant on a graphic interface; c) association of real-time data (process conditions, maintenance status, alarms, etc.) and documentation (certificates, permit to work...) to each mapped element; d) evaluation of probabilities and consequences of accidents, given real time and/or user input data (meteorological conditions, type of rupture, etc.); e) hazard-risk assessment and visualization of possible dominos following safety/security events; f) real-time mapping of barriers and their performance supporting emergency response.

The experience obtained with the DEMOs will facilitate and enable the extension of the procedure in the considered regions of interest, potentially affecting the risk monitoring and reduction of other Seveso sites.



## Partners

The Department of Civil and Industrial Engineering – University of Pisa

DataCH Technologies designs and manufactures modular computer systems, specialized in the development of software for the management of safety and security in the port and industrial sectors.

Founded in 2001, Crisisplan B.V. is a small Dutch organization (SME) of dedicated crisis professionals.

ARPAT is the Tuscan regional agency for environment protection and the public authority in charge of applying Seveso Directive in Tuscany, participating to licensing and inspection of all regional Seveso sites.

The Institute of Security and Global Affairs – Leiden University is a scientific institute that specializes in security issues.

## DEMO sites:



DEMO 1 - Costieri D'Alesio S.p.A. is a petroleum depot dedicated to storage and handling of petroleum and petrochemical products based in Livorno.

DEMO 2 - Bolton Group (Manetti & Roberts). Calenzano plant produces and commercializes personal care products. Activities in the Calenzano plant involve the production and packaging of both liquid and gaseous personal-care items.

DEMO 3 - Wilhelmsen Ships Service is a comprehensive global maritime group providing essential products and services to the merchant fleet, in Rotterdam and globally.