

CHALLENGE – IMPROVING RESPONSES TO DISRUPTIONS

About the challenger – Valenciaport Cluster Innovation Committee

The **Valenciaport Cluster Innovation Committee** promotes collaborative projects within the port logistics community to turn shared operational needs into pilot schemes and scalable solutions.

Challenge description

Ports are increasingly exposed to disruptions that can have an immediate impact on safety, service levels, and operational continuity. In Valencia, these disruptions include **extreme weather events, security incidents, power failures, cyberattacks, logistical congestion**, and external crises affecting the supply chain. When they occur, the challenge is not only to detect them early, but also to **coordinate decisions and responses amongst a wide range of stakeholders**: the port authority and maritime authorities, terminals, technical and nautical services, customs and inspections, shipping lines/freight forwarders, logistics operators and land transport.

The vision behind this challenge is a **comprehensive platform for monitoring, prediction, and enabling collaboration and response** that strengthens the end-to-end resilience of the Port of Valencia. The solution must function as a digital layer of resilience, unifying real-time signals, predictive capabilities and response orchestration to **anticipate disruptions before they affect operations, assess impacts on terminals and critical services, and activate potential action protocols** across the entire cluster.

The platform should integrate real-time monitoring via **IoT sensors** (e.g. weather, pollution, structural vibration or asset location), incorporate **machine vision** for security and **drones** for inspections where this adds value, and connect with relevant external sources such as **AEMET, Puertos del Estado** or **EMSA**. It must also support advanced analytics, including **AI for risk prediction**, geospatial visualisation with **GIS** and, where justified, a **Digital Twin-type** view to simulate scenarios and understand the impact. Given that disruptions can degrade connectivity and availability, resilience by design is key.

The ambition is to move towards a **smart and resilient** port infrastructure, aligned with continuity and security standards such as **UNE-ISO 22301** and **ISO 28000**, and with sustainability frameworks such as **the SDGs** and **the Green Deal**.

The challenge lies in providing solutions that contribute to this vision. We are seeking comprehensive solutions, but also solutions with partial approaches that offer significant added value. To this end, the following areas of potential disruption to port business continuity have been identified, which can be addressed either comprehensively or partially:

- Weather risks, wind, severe storms, or maritime storms.
- Congestion risks due to disruptions in land or maritime traffic, for example, due to the geopolitical situation, which impact infrastructure planning in the medium and long term, but also in the short term.
- Disruptions to the energy supply within the port.
- Cyberattacks and cybersecurity risks.
- Threats at port locations with significant passenger traffic, such as passenger terminals, including, for example, pandemics, terrorist attacks, fires, etc.

Expected outcomes

Each participating start-up will co-create a **conceptual design** of their proposed platform tailored to the Port of Valencia, explaining how data is captured and integrated, how predictions and alerts are generated, and how these translate into coordinated actions among the various stakeholders. In addition, a **clear path towards a Proof of Concept (PoC)** should be defined, with an initial limited pilot (for example, response to severe storms, coordinated diversion of lorries and trains in the event of congestion, or coordination in the event of a power cut/cyber incident), identifying minimum integrations, resilience requirements and success criteria that demonstrate real improvement in coordination and continuity.