

PORT ASSESSMENT



CETENA can support Port Authorities, Coast Guard, Public Institutions and commercial operators by offering an interdisciplinary approach, to develop new logistics areas or enhancing the existing ones.

Port Assessment is the design and verification fundamentals that address all the various specific issues with an integrated approach. We can identify solutions that optimize the operability of new infrastructure layouts or analyze existing scenarios to assess their actual operational safety limits using CETENA's in-house developed hardware and software tools.



THE ITALIAN SHIP RESEARCH CENTRE

a **FINCANTIERI** company

Port Assessment

Vessel traffic safety in port environments, in restricted waters or near offshore infrastructures requires both high technical knowledge and a lot of experience. CETENA's team of experts offers consultancy services and tools specific to its clients' needs, using the most advanced technologies. CETENA carries out risk analysis, manoeuvre simulations, mooring analysis, port logistics analysis and environmental measurements in the context of Port Assessment.

The combination of these competences allows us to provide services aimed at:

- Design of new port infrastructures;
- Determination of operational safety limits of existing infrastructures;
- Identification of barriers to mitigate the risk related to traffic patterns or infrastructure layouts.

Our methodology involves port stakeholders in assessing the characteristics of the scenario to identify challenges and operational needs. These activities represent an innovative service that supports the development of new infrastructure and procedures by creating digital twins that ensure an early analysis of the port's production, development or management processes.

- **Risk Analysis**

The risk analysis is a collaborative process involving the main port operators. It leads to the definition of shared solutions through certified procedures that are consistent with the expected safety standards. This method is aimed at identifying hazards associated with the navigation of vessels within the areas under study. It allows the identification, if necessary, of appropriate risk mitigation solutions.

- **Manoeuvring simulation**

This innovative service for the industry creates digital twins of infrastructures and vessels to evaluate the production and development process. The CETENA manoeuvre simulators incorporate the mathematical models of ship manoeuvrability, seakeeping and port environmental characteristics, entirely developed by CETENA, and allow the consideration of contextual manoeuvring modes and experiences. This activity involves all stakeholders and ensures an early analysis of the infrastructure production or development process.

- **Mooring Analysis**

The mooring system analysis assesses the loads on ship and pier mooring fittings from wind, current and sea forces. This enables CETENA to fully support the design of optimized mooring systems and pier layouts for new or existing terminals. In addition, the ships safe mooring operations environmental limits can be determined. CETENA's expertise is based on the integration of theoretical, engineering and practical knowledge, including close collaboration with Captains and seafarers at Fincantieri Group shipyards.

- **Port & Logistics**

The analysis of the interaction between ship and car traffic, as well as the study of mobility and pedestrian permeability, are crucial to understand and managing urban and port dynamics through integrated models for planning and managing port systems. These models are based on advanced simulation techniques aimed at assessing the impacts of port activities on the surrounding system and identifying optimal management strategies.

- **Environmental measurements**

CETENA carries out measurement campaigns to assess the impact of pollutants emitted into the atmosphere and marine environment (such as airborne noise, waterborne noise and exhaust gases). The aim is to verify the presence of pollution situations and to build simulation models useful to choose technological solutions that effectively manage their environmental impact.