

TECHNOLOGY DIVISION BRIEF

The Challenge

Every day, maritime professionals rely on technology to make thousands of operational decisions. From monitoring vessel arrivals and assigning berths to coordinating cranes, tracking cargo, and responding to unexpected disruptions, software systems help transform complex operational data into meaningful information that supports safe and efficient decision-making.

Behind every one of these systems is a team of technology professionals responsible for designing, developing, testing, and improving the digital tools that keep ports, shipyards, and maritime operations running smoothly.

Your team has been commissioned by the Port Authority to develop a Smart Port Management Platform that helps port operations managers monitor daily activities, coordinate resources, and respond to changing conditions. Throughout the challenge, your team will develop a software solution that transforms operational data into information that helps users make faster, smarter, and more informed decisions.

About This Brief

This Division Brief introduces this year's challenge and provides the information teams need to begin exploring, planning, and preparing for the challenge. It outlines the challenge purpose, overall objectives, and high-level expectations for the division.

A detailed Division Guide will be released separately and will serve, along with this brief, as the primary reference throughout the challenge season. The guide will include team expectations, checkpoints, documentation requirements, technical requirements, procedures, judging information, and other details needed to prepare for competition day.

Real World Connection

Modern ports depend on sophisticated software systems to coordinate thousands of daily operations. Technology professionals develop applications that monitor vessel traffic, schedule resources, analyze operational performance, visualize complex data, and provide decision support to maritime professionals responsible for keeping cargo and vessels moving safely and efficiently.

In Hampton Roads, technology companies work alongside ports, shipyards, defense contractors, logistics providers, and maritime organizations to develop software solutions supporting national defense, global commerce, offshore energy, and advanced manufacturing.

These professionals combine programming, software engineering, data analytics, user experience design, cybersecurity, automation, and systems integration to solve complex operational challenges across the maritime industry.

Your Challenge

Your team has been selected to develop the next generation of intelligent port operations software.

Using operational datasets provided, your team will design and develop a Smart Port Management Platform capable of monitoring vessel arrivals, berth assignments, crane utilization, truck scheduling, cargo movement, and overall port activity.



Your software should organize operational information into a clear, intuitive interface that helps a Port Operations Manager understand current conditions, identify potential issues, and make informed operational decisions.

During competition day, judges will introduce unexpected operational disruptions. Your team will demonstrate how your software analyzes the updated information, communicates the impact, and supports decision-making in response to the changing conditions.

Success will depend not only on developing functional software but on creating a solution that is reliable, intuitive, adaptable, and valuable to the professionals who use it.

Things to Consider

User-Centered Design: Your software should be designed for the people who use it. Consider what information is most important, how it should be presented, and how users will interact with your platform during both routine operations and unexpected disruptions.

Data Management & Visualization: Modern software transforms complex datasets into meaningful information. Consider how your platform organizes, displays, and communicates operational data using charts, dashboards, tables, alerts, or other visual tools.

Decision Support: Technology should support informed decision making rather than simply displaying information. Consider how your platform identifies trends, highlights issues, recommends actions, or helps users evaluate available options.

Software Design: Develop software that is organized, reliable, and maintainable. Consider how your application is structured, how information flows throughout the system, and how future improvements could be incorporated.

Adaptability: Operational conditions can change rapidly. Successful software systems respond effectively to new information while continuing to provide accurate and useful decision support.

The maritime industry continues to evolve through advances in software engineering, automation, artificial intelligence, predictive analytics, digital twins, and connected systems. While your solution should meet the functional requirements of the challenge, you are encouraged to explore creative approaches that improve the user experience and operational effectiveness.

The Digital Ship Challenge organizers would like to stress that the majority of work on all phases of the project is to be designed and constructed by the students.

Judging Overview

Teams will be evaluated on multiple aspects of software development, system design, and professional communication.

Evaluation will include:

- Digital Notebook
- Team Checkpoints
- Team Poster and Presentation
- Demonstrated Performance



Challenge Requirements

Teams will design, develop, and demonstrate a software solution that supports maritime port operations.

Each team must:

- Develop a functional Smart Port Management Platform
- Utilize provided operational datasets
- Present information through an effective user interface
- Support operational decision-making through software functionality
- Demonstrate the software during a live client scenario
- Document the design and development process
- Comply with all competition rules and submission requirements

Additional functional requirements, datasets, software specifications, and competition procedures are provided in the Technology Division Challenge Guide.

Intent to Participate

Schools planning to participate in the 2027 Digital Ship Challenge should submit an intent to participate by September 11, 2026. This form is not your official team registration. Teachers will simply indicate the divisions they plan to enter and the anticipated number of teams. Team names and student information will be collected at a later date.

Complete the intent to participate form here: <https://forms.office.com/r/RHVKYCEREB>

