ACCSEAS
ACCessibility for Shipping, Efficiency Advantages and Sustainability

ACCSEAS is a 3-year project supporting improved maritime access to the North Sea Region through minimising navigational risk.

With European transport policy providing a shift to seaborne transport, using Short Sea Shipping to avoid road bottle necks to the movement of goods, services and people, efficient and effective marine navigation services have never been more important. By looking to harmonise maritime information and how it is exchanged and by offering training provision to support real-world implementation, ACCSEAS will ensure that e-Navigation provision in the North Sea contributes a beneficial and lasting impact on the resilience of the Region’s critical infrastructure in terms of safety, security, economic growth and environmental protection. ACCSEAS will build on the findings of previous and current related regional projects and focus on co-operation in key areas of technology and infrastructure services that underpin maritime navigation and safety – looking to further enhance them.

The Project will:
- identify key areas of shipping congestion and limitation of access to ports;
- define solutions by prototyping and demonstrating success in an e-Navigation test-bed at North Sea regional level.

Following the guidance and regulatory framework of the EU, the International Maritime Organisation (IMO) and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), ACCSEAS will look to prove the success of new e-Navigation concepts by producing four key types of results and outputs:

1. **A PRACTICAL TEST-BED** implementing real equipment and infrastructure in the form of e-Navigation prototypes and complementary simulations to test these;

2. **A DATABASE OF INFORMATION** demonstrating the effectiveness of the prototypes – primarily in the form of baseline information – concerning vessel routes in the North Sea Region and coverage maps of the geographical extent of e-Navigation services for the prototypes. (This information will be stored in an ACCSEAS Geographical Information System – GIS);

3. **SYSTEMS ENGINEERING DOCUMENTATION** covering the problems and possible solutions for maritime access issues in the North Sea Region, how the e-Navigation prototypes and simulations were developed to address these, and an assessment of best practices involved in establishing e-Navigation regional solutions;

4. **ANALYSIS OF THE LESSONS LEARNED, ADVICE on the TRAINING MODULES for PRACTICAL E-NAVIGATION solutions.**

These outputs will then inform policy development and influence the creation of any necessary institutional structures and regulatory instruments needed to deliver future e-Navigation Aids to Navigation services.

Approved and part-funded by EU’s INTERREG IVB North Sea Region Programme as a transnational project, key navigation authorities and maritime administrations supporting ACCSEAS have come together to deliver the project from Denmark, Germany, Sweden, Norway, the Netherlands and the United Kingdom.

For more information, please contact Georgina Button: +44 1255 245010 or georgina.button@gla-rnav.org
E-Navigation Challenge of the North Sea

Explore e-Navigation solutions for:
- Increasing density of shipping
- Reduced sea room / manoeuvrability
- Growth of offshore installations
- Traffic pinch-points at approach to:
  - major ports and constrictions
  - Baltic/Skagerrak, English Channel
  - inland waterways (e.g. Kiel Canal)
  - Reduce risk of collision & grounding
  - Safe & efficient access

ACCESEAS Overview

- Runs for 3 years: April 2012 to February 2015 ($5.6M budget)
- 11 partners across Denmark, Germany, Netherlands, Norway, Sweden and UK
- Extends concepts from ‘EfficienSea’ (Baltic Sea) and ‘Monalisa’ projects
- Innovative prototype of e-Navigation ‘ship-to-ship’ and ‘ship-to-shore’ solutions
- Resilient positioning, navigation and timing (PNT)
  - supports robust e-Navigation information and services
- Establishes safe efficient options for berth-to-berth operations
  - dynamic route planning, information exchange, portrayal and decision aids

Systems Engineering Approach

Guided by and informing IMO, IALA and European (e.g. e-Maritime) framework

Requirements
- Focus on Mariner / Human Factors
- NSR traffic analysis and prediction
- Traffic volume, human error, degree of risk

Architecture
- Integrated ship and shore
- Extended S-100 data harmonisation

Implementation, Verification, Validation
- Real & simulated environments
- User experiences
- Early detection of areas of improvement
- Influence institutional standards and policy

Test-Bed: Resilient Positioning

- Mitigation of Global Navigation Satellite System (GNSS) vulnerability to natural and deliberate interference
- Independent & complementary backup system to GNSS
  - seamless positioning in GNSS outages
  - avoid Hazardously Misleading Information
- Prototype Integrated Navigation System (INS)
  - radar positioning, R-Mode & inertial technologies
  - recognising multiple GNSS constellations (including Galileo)
  - integration with currently available positioning sources (e.g. eLoran)

Test-Bed: E-Navigation Services

‘Berth-to-berth’ applications of the Maritime Service Portfolio for safety, efficiency and environmental protection

- Dynamic vessel route planning / update, exchange and portrayal:
  - ship-to-ship: route and intended manoeuvre
  - ship-to-shore: Vessel Traffic Service (VTS) interface and elements of ‘Sea Traffic Management’
  - port operations: Master Pilot Exchange (MPX) / ePassage planning
- Exchange of data and information ship-to-ship and ship-to-shore:
  - seamless exchange of static vessel and dynamic voyage data
  - extended S-100 format data within IHO GI registry
  - test-bed interface via Inter-VTS Exchange Format (IVEF)
  - compatibility with EU e-Maritime ‘single window’ applications
- Extended functions of virtual / AIS Aids-to-Navigation

ACCESEAS E-Navigation Outcomes

- Geographic Information System (GIS) to describe and visualise e-Navigation:
  - traffic patterns, priority locations, restricted areas, route topology models, route optimisation in open seas, infrastructure, resilient PNT coverage, service coverage areas
- Physical test-bed of ship prototype equipment and shore infrastructure
- Simulation capability for evaluation of Human Factors, technology and training
- Training Needs Analysis and training packages for a range of stakeholders
- Annual ACCSEAS conference
- Legacy for future co-ordination of regional North Sea e-Navigation
  - ‘e-Navigation Stakeholders Forum’
  - ‘e-Navigation service providers co-ordination group’
- Develops e-Navigation sustainability plan (2015 to 2020)