Strategy and action plan for e-Navigation

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This document describes the IMO e-Navigation strategy and recommends a Danish strategy for e-Navigation and associated action plan.

The purpose of the Danish strategy is to create the preconditions for a more efficient exchange of information of importance to safe navigation and effective transport and logistics in Danish ships, waters and ports as well as for Danish ships globally. At the same time, the aim is to maximize the benefit to the Danish maritime sector when it comes to meeting the need for technological progress, while at the same time promoting the potential for innovation and growth that the development is expected to generate over the next 5-10 years.

The purpose is to support the general goals of the Danish Maritime Authority and the Ministry of Business and Growth:

- Increased safety and environmental protection within the maritime sector
- More efficiency, reduction of administrative burdens and costs imposed on both the industry and the State
- Growth in the maritime industries by means of support for the recommendations of the Growth Team for Blue Denmark, as summarized in the vision:

Denmark as the maritime centre of Europe

The action plan recommends the following overall initiatives:

- Coordinated efforts for internationally harmonised requirements and standards that support automated maritime information exchange
- Effectivisation of the authorities' exchange of information and reporting needs related to shipping
- Promotion of innovation networks and specific projects focusing on how the development of automated information exchange can generate value, growth and jobs with Danish stakeholders

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Background

What is e-Navigation

Navigation and communication systems fitted on board ships are, to a high extent, regulated by an international set of regulations. While this set of regulations secures a high degree of global compatibility between systems for navigation and communication, current regulation creates barriers to technological developments – and thus to an effective presentation of information.

Therefore, ships' mandatory navigation and communication equipment is, to a high degree, islands of information, and the communication is based on technologies such as radiotelephony, telephone and telex. One of the most modern types of equipment that is being phased into maritime navigation is electronic chart display and information systems (ECDIS), the development of which started in the 1980s. Already today, ECDIS suffers under its technological age.

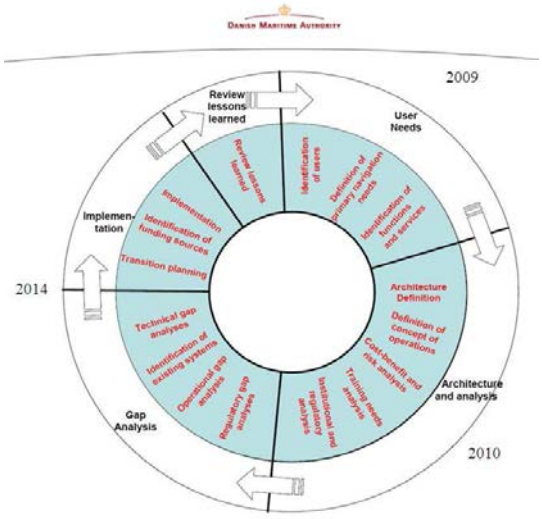
Only very few persons on the globe today could imagine a world based on information on paper forms, ordinary delivery of mail, communication exclusively by phone and TELEX and without any digital self-service systems, Google Earth or the availability of information on the Internet.

While backwards compatibility with existing equipment is necessary and desirable, e-Navigation means a shift in technological thinking and architecture of dimensions to the maritime navigation task, comparable to the impact that the Internet has had ashore.

The IMO defines e-Navigation as an iterative development strategy based on harmonisation of maritime navigation and information systems.

Definition (IMO MSC 85/26/Add.1 Annex 20)[1]:
'e-Navigation is the harmonised collection, integration, exchange, presentation and analysis of maritime information onboard and ashore by electronic means to enhance berth to berth navigation and related services, for safety and security at sea and protection of the marine environment'

e-Navigation aims at a gradual, evolutionary transition towards automated digital information exchange, both internally on board ships, ship-to-shore as well as between stakeholders ashore, and an integrated task-focused presentation based on internationally harmonised standards.



[1] See also IALA's 'Frequently Asked Questions' on e-Navigation: http://www.iala-aism.org/iala/FAQS/FAQse-nav.pdf

Through an optimised availability of information, the intention is to reduce the risks and enhance safety within maritime transport, to make the distress planning and rescue operations at sea more efficient, to reduce the impact on the environment and not least to improve the user-friendliness of equipment on board ships.

At the same time, the aim of the Danish Maritime Authority is that e-Navigation is to contribute to making the operation of quality shipping more efficient, including to create coherence in the maritime and shore-based transport chains. Quality operators of ships, who are prepared to invest in modern information systems, must be able to achieve a more efficient and un-bureaucratic operation. For example, Danish ports should be able to acquire a status as efficient and un-bureaucratic to call at, Danish ships and shipowners should be considered safe, resource- and environmentally conscious and the Danish marine equipment industry should be considered a frontrunner.

Authorities with tasks related to ships' voyages in Danish waters, calls at Danish ports or otherwise ships' movements can benefit from a LEAN presentation of the related administrative processes.

The IMO is striving for an implementation plan for e-Navigation to be approved by the Maritime Safety Committee in 2014. This work is supported by all major international organisations related to the maritime field (IMO, IHO, IALA, as well as ITU and ICAO). The adoption of this implementation plan will presumably initiate a scrutiny and updating of international regulation on the future requirements for ships' equipment and procedures and performance standards for technical equipment as well as create a need for modernising the shore-based systems and services supporting shipping.

It is the ambition of the Danish Maritime Authority that Danish authorities, shipowners and companies are to be engaged to the widest extent possible in the safety and commercial potentials that this development will create both in Denmark and on the export markets to secure Danish jobs.

In addition to operational effectivisation as such, efficient presentation of information has the potential for reducing the environmental impact of shipping. Fuel consumption is expected to be reduced by means of optimised routeing plans on the basis of the availability of detailed weather forecasts as well as prognoses on waiting times at port calls, traffic conditions, etc.

Several countries have – without much success – tried to implement shore-based pilotage. New technological developments that connect shore and ship much better electronically must be used for trials with shore-based pilotage.

A Danish strategy for e-Navigation

Safety and growth
The international e-Navigation strategy is to promote safe navigation and safety at sea in Danish waters and on board Danish ships – including reduce the risks of environmental disasters as well as the loss of human lives and values.

At the same time, the possibilities of innovation in the Danish maritime sector that the development is expected to result in over the next 5-10 years must be transferred into value generation, growth and jobs.

Therefore, the Danish strategy for e-Navigation must promote public/private cooperation in innovative networks, focused on these goals.

- **Safe navigation and safety at sea.** As a leading nation as regards quality shipping, we want the highest degree of safety in Danish waters and on board Danish ships. Consequently, we also want to be a frontrunner within e-Navigation and, thus, affect the development at the practical, technological level in order to create user-friendly, safe and effective solutions. At the legislative level, we will work for ambitious regulation promoting the conditions of quality shipping.

- **Productivity improvement.** In order to secure Danish shipowners, ports and the transport sector the best possible competitiveness, it is a goal to reduce the administrative burdens as well as to create a better basis for planning and thereby to contribute to increase the productivity of quality shipping. The new generation of information systems provides the potential for this. Not only in the navigational field, but also as regards a number of logistical and administrative functions that Danish shipowners, ports and related companies can benefit from.

- **Still more efficient solving of tasks by the Government** as regards maritime convention obligations and service, including cooperation with neighbouring countries about the implementation of e-Navigation.

- **Growth and jobs.** The coming implementation of the system will create a potential market for solutions – at the system, equipment, application and service level. It is a goal that the Danish service and equipment industry that already has a position of strength in this area must have the greatest possible share of this market.

Through information, networking and specific project cooperation, Danish stakeholders are to be involved in the development and be dressed to take part in national and international developments and competition.

As regards the national implementation of e-Navigation, the goal must be improvement of maritime transport. Focus must be on early implementation of solutions that add value.

From strategy to action

It is predicted that the goals of the Danish strategy for e-Navigation will be realised in this manner:

Safe navigation and safety at sea

The Danish Maritime Authority must contribute actively to maintaining a high level of ambition for the IMO implementation plan for e-Navigation, including invite Danish stakeholders to cooperate on the following:

- Development of international requirements for integration of ships' communication and display equipment focusing on user-friendly safety.
- Development of internationally harmonised standards on automation of ships' administrative reporting routines in order to release navigating officers from administrative burdens.
- Development of internationally harmonised standards and national systems capable of supporting an efficient exchange of information and reducing the language barriers at VTS centres, bridge watches, etc.
- Development of automated systems for support of ship monitoring and automatic detection of abnormal behaviour.
- Improvement of ships' capability for safe position-fixing (Resilient PNT – Position, Navigation and Timing).
- Carrying out of demonstration projects capable of qualifying innovative solutions with a view to standardisation and early national and regional implementation of solutions that create value.

Productivity improvements

In cooperation between Danish shipowners, ports, land-based companies and authorities, specific project networks are established focusing on automation of ships' reporting and maritime supply chain integration with the land-transport sector. The goal is early implementation of national systems in support of the automation of ships' administrative reporting routines, when passing and calling at Danish ports, possibly in cooperation with the other Scandinavian countries. The work can be supported by the EU Baltic Sea strategy, if relevant.

This should not only be considered digitisation of existing work procedures. Under the umbrella project "Lean Ship of the Future", a lean-based approach is applied to the removal of barriers, double work and unnecessary manual processes. National solutions are intended to ensure that Danish ports are considered efficient and non-bureaucratic to call at, focusing on supply chain integration for companies engaged in transmodal transport and logistics – with the ports as the connecting link.

The preconditions for and solutions to fuel-optimisation of shipping lanes as well as the potential of shore-based pilotage must be examined.

The solutions are coordinated with related EU initiatives and promoted in international harmonisation so that the solutions implemented support Danish ships engaged in global trade and that it is possible to export know-how and technical solutions.

Still more efficient solving of tasks by the Government

Danish authorities with tasks related to ships' voyages and port calls should – together – carry out a Lean analysis of the administrative processes related to shipping. If any potential for effectivisation or simplification of the Government's administrative processes is identified in this connection, this potential should be used. At the same time, it must be ensured that the administrative burdens experienced by ships are hereby reduced.

The organisation of the Government's tasks related to the maritime convention obligations on distress, urgency and safety communication should be subject to a similar Lean analysis. The purpose is to ensure the implementation of a modernised technical infrastructure capable of supporting both e-Navigation and distress communication in the most cost-effective manner. In this connection, it would be an obvious idea to examine the possibilities for cooperation with our neighbouring countries around the Baltic Sea and the North Sea.

Growth and jobs

Through the involvement of Danish shipowners and ports in the development of solutions focusing on effectivisation, investments in e-Navigation solutions should be profitable, retain jobs in the Danish maritime sector and create a basis for growth.

Furthermore, Danish businesses within the areas of equipment and systems for the maritime sector should be invited for cooperation in innovation networks capable of making them get the largest possible share of the coming, potential export market in know-how and solutions at the system, equipment, application and service level.

Kick-start

Danish e-Navigation seminar

In order to promote the creation of innovation networks on e-Navigation and specific project initiatives, a Danish e-Navigation seminar will be held by the growth project Lean Ship on 20-21 August 2013 for the maritime industry, the authorities and researchers. Day 1 will consist of presentation and knowledge-sharing as well as brainstorming over challenges and possibilities. Day 2 will contain innovation workshops focused on specific challenges as well as information about the possibilities of financing large-scale projects. In the areas that turn out to have the greatest potential for creating growth, the intention will be further innovation cooperation or later discussions of possible, specific project initiatives among interested parties.