e-NAV12 Information paper

Agenda item WG6

Task Number

Author(s) Danish Maritime Authority

Maritime Information S-100 Product Specification

# Summary

There are many similarities and few differences between Maritime Safety Information messages and Notices to Mariners. The main difference is the speed and ways of promulgation and thereby the possibility and time for quality assurance. The content is on the other hand more or less the same. A common concept for the two is therefor obvious.

This document describes the concept of Maritime Information messages, their nature and content. The work is still at an early stage. Stakeholders are welcomed to comment and contribute to the product specification. The work will be continued within the ACCSEAS project.

# Action requested of the Committee

The Committee is requested to take note of the MSI/NtM S-100 work initiated by the Danish Maritime Authority.

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# Overview

## Introduction

*Maritime Safety Information (MSI) is navigational and meteorological warnings, meteorological forecasts and other urgent safety-related messages.*

*Notices to Mariners (NtM) are promulgated in order to keep nautical charts and publications, as far as possible, up to date. Notice to Mariners (NtM) advise mariners of important matters affecting navigational safety, including new* [*hydrographic information*](http://en.wikipedia.org/wiki/Hydrography)*, changes in* [*channels*](http://en.wikipedia.org/wiki/Channel_(geography)) *and aids to* [*navigation*](http://en.wikipedia.org/wiki/Navigation)*, and other important data.*

The main differences between MSI and NtM today are the speed of promulgation and thereby quality assurance.

MSI is today promulgated in text or voice via SafetyNET, NAVTEX, coast radio stations and is in some countries accessible on the Internet. NtM’s are promulgated on paper weekly, fortnightly or monthly and are often accesible on the internet.

All of above methods are time consuming for the Mariner and there is a risk of human error. Some navigation equipment developers are working on systems taking existing messages from NAVTEX broadcasts and transferring them into geo-referenced warnings for presentation on navigation displays. There are many advantages in this approach building on already established systems but a number of limitations still exist.

NtM and MSI have on the other hand a lot of communalities. This product specification specifies a common concept, the Maritime Information Message.

Maritime Information Messages may in the future be broadcasted or transmitted via any available communication method available, e.g. satellite, GSM (mobile), VHF-data and AIS, in addition to traditional systems such as NAVTEX and radio broadcasts. Maritime Information Messages should be received and displayed on navigation displays automatically for correct and immediate assessment by the navigator.

## References

[S-100] Universal Hydrographic Data Model. IHO Special Publication No. S-100, Edition 1.0.0, January 2010. International Hydrographic Bureau, Monaco.

[S-101] Electronic Navigational Chart Product Specification. IHO Special Publication No. S-101, (Draft), International Hydrographic Bureau, Monaco.

## Terms and definitions

The terms and definitions in S-100 apply to this document.

## Abbreviations

**DMA** Danish Maritime Authority

**ECDIS** Electronic Chart Display Information Systems

**ENC** Electronic Navigational Chart

**IALA** International Association of Marine Aids to Navigation and Lighthouse Authorities

**IHO** International Hydrographic Organisation

**JSON** JavaScript Object Notation

**MSI** Maritime Safety Information

**NtM** Notices to Mariners

**XML** Extensible Markup Language

**XSD** XML Schema Definition

## General Data Product Description

|  |  |  |
| --- | --- | --- |
| Name | | Maritime Information Product Specification |
| Abstract | | This product specification introduces Maritime Information Messages, a combination of MSI and NtM messages. MSI and NtM share communalities that allow them to be modelled as one product. |
| Content | | This Product Specification is a complete description of all the appropriate features, attributes and their relationships necessary to exchange Maritime Information Messages. The precise content is documented within the Feature Catalogue and the relationships defined in the Application Schema. |
| Spatial Extent | Description | Global, marine areas only |
| East Bounding Longitude | 180 |
| West Bounding Longitude | -180 |
| North Bounding Latitude | 90 |
| South Bounding Latitude | -90 |
| Specific Purpose | | The product specification describes data that can be exchanged between maritime stakeholders as shore authorities and ships. |

## Data product specification metadata

|  |  |
| --- | --- |
| Title | Maritime Information Product Specification |
| Version | 0.0.1 |
| Date | 05 September 2012 |
| Language | English |
| Classification | Unclassified |
| Contact | e-Navigation Team Danish Maritime Authority  Overgaden oven vandet 62B  DK-1415 København K  Telephone: +45 40 72 61 08  Email: [obo@dma.dk](mailto:obo@dma.dk) |
| URL | service.e-navigation.net |
| Identifier | MARINF |
| Maintenance | Changes are coordinated by the author |

# Specification scope

The MARINF product specification requires only one scope.

|  |  |
| --- | --- |
| Scope identification | General Scope |
| Level | General Scope |
| Level name | General Scope |

# Data product identification

|  |  |
| --- | --- |
| Title | Maritime Information |
| Alternate title | MARINF |
| Abstract | Data containing Maritime Safety Information and Notices to Mariners. |
| Topic category | TRANSPORTATION |
| Geographic description | Marine areas |
| Spatial resolution | Display scale |
| Purpose | Promulgation of maritime information and integration into navigational display systems. |
| Language | English and possibly local languages |
| Classification | Unclassified |
| Spatial representation type | Vector |
| Point of contact | Producing competent national authority |
| Use limitations | Not to be used without ENC |

# Data content and structure

## Application Schema

Figure 4‑1 shows an overview of the involved packages and classes.



Figure 4‑1 Domain Model

Figure 4‑2 shows the two feature types MsiMessage and NoticeMessage. Both inherit from the abstract class MaritimeInformationMessage.



Figure 4‑2 Maritime Information Message

Figure 4‑3 shows the information types involved in exchanging messages.



Figure 4‑3 Maritime Information Message Exchange

## Feature Catalogue

This feature catalogue defines the features and attributes permitted in this product.

|  |  |
| --- | --- |
| Name | Maritime Information Feature Catalogue |
| Scope | Contains objects associated with maritime information messages |
| Field of application | Marine navigation |
| Version Number | 0.0.1 |
| Version Date | 05 September 2012 |
| Producer | Danish Maritime Authority |

The table below lists all objects and attributes used in this product specification.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Register** | **Index** | **Alpha code** | **Name** | **Version date** |
| MARINF | Feature | MAINME | Maritime Information Message | 2012-09-05 |
| MARINF | Feature | MSIMSG | MSI Message | 2012-09-05 |
| MARINF | Feature | NOTMSG | Notice Message | 2012-09-05 |
| MARINF | Feature | MAMAAR | Maritime main area | 2012-09-05 |
| MARINF | Feature | NVTMSG | Navtex message | 2012-09-05 |
| MARINF | Information | MAIMLO | Maritime Information Message Location | 2012-09-05 |
| MARINF | Information | MAIMPO | Maritime Information Message Position | 2012-09-05 |
| MARINF | Information | MAIMSO | Maritime Information Message Source | 2012-09-05 |
| MARINF | Information | MAIMPU | Maritime Information Message Publisher | 2012-09-05 |
| MARINF | Attribute | MIMUID | Unique message id | 2012-09-05 |
| MARINF | Attribute | MIMVER | Version | 2012-09-05 |
| MARINF | Attribute | MIMREF | Reference number | 2012-09-05 |
| MARINF | Attribute | MIMTXT | Text content | 2012-09-05 |
| MARINF | Attribute | MIMLTX | Local text content | 2012-09-05 |
| MARINF | Attribute | MIMVLF | Valid from date | 2012-09-05 |
| MARINF | Attribute | MIMVLT | Valid to date | 2012-09-05 |
| MARINF | Attribute | MIMCHR | Affected charts | 2012-09-05 |
| MARINF | Attribute | MIMUPD | Last updated date | 2012-09-05 |
| MARINF | Attribute | MIMCNL | Cancelled date | 2012-09-05 |
| MARINF | Attribute | MIMCRD | Created date | 2012-09-05 |
| MARINF | Attribute | MIMSTS | Message status | 2012-09-05 |
| MARINF | Attribute | MIMREF | Message references | 2012-09-05 |
| MARINF | Attribute | MIMSRC | Message source | 2012-09-05 |
| MARINF | Attribute | MIMPUB | Message publisher | 2012-09-05 |
| MARINF | Attribute | MIMLOC | Message location | 2012-09-05 |
| MARINF | Enumeration | MAIMST | Maritime Information Message Statuses | 2012-09-05 |

The rest of the list is intentionally skipped for brevity. The data model is an early draft and a complete feature catalogue is postponed until a more completed data model is ready.

### Feature Types

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Geo Object Class | Maritime information message | | Alpha code | **MAINME** |
| Camel case | **MaritimeInformationMessage** | | Abstract type | True |
| Definition | Abstract feature type for representing the generalisation of MSI message to Notice message. | | | |
| References |  | | | |
| Remarks | No remarks | | | |
| Distinction | No distinction | | | |
| **Attribute** | | **Camel case** | **Alpha code** | **Cardinality** |
| Unique id | | uid | MIMUID | 1 |
| Version | | version | MIMVER | 1 |
| Reference number | | refNo | MIMREF | 1 |
| Status | | status | MIMSTS | 1 |
| Text | | text | MIMTXT | 1 |
| Local text | | localText | MIMLTX | 0..1 |
| Valid from | | validFrom | MIMVFR | 0..1 |
| Valid to | | validTo | MIMVTO | 0..1 |
| Charts | | charts | MIMCHR | 0..\* |
| Updated | | updated | MIMUPD | 0..1 |
| Cancelled | | cancelled | MIMCNL | 0..1 |
| Created | | created | MIMCRT | 1 |

The rest of the feature types are skipped intentionally for brevity. The data model is an early draft and a complete feature catalogue is postponed until a more completed data model is ready.

### Information Types

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Inf. Object Class | Maritime information message source | | Alpha code | **MAIMSO** |
| Camel case | **MaritimeInformationMessageSource** | | Abstract type | False |
| Definition | The source of a message given as name and country | | | |
| References |  | | | |
| Remarks | No remarks | | | |
| Distinction | No distinction | | | |
| **Attribute** | | **Camel case** | **Alpha code** | **Cardinality** |
| Name | | name | MIMSNA | 1 |
| Country | | country | MIMSCN | 1 |
| Date | | date | MIMSDT | 1 |

The rest of the information types are skipped intentionally for brevity. The data model is an early draft and a complete feature catalogue is postponed until a more completed data model is ready.

### Property types

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Unique id** | **Alpha code** | **MIMUID** |
| Attribute type | simple | Data type | String |
| Camel case | Uid | | |
| Definition | Unique id for this message across all versions of the message. The id must be unique for the source, but may not be unique across different sources. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Version** | **Alpha code** | **MIMVER** |
| Attribute type | simple | Data type | Int |
| Camel case | Version | | |
| Definition | Version number for message. | | |
| Constraints | > 0 | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Reference number** | **Alpha code** | **MIMREF** |
| Attribute type | simple | Data type | String |
| Camel case | refNo | | |
| Definition | Source defined reference number. May differ for different versions of the same message. Must be unique across all sources, e.g. by appending country code. | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Attribute** | **Status** | **Alpha code** | **MIMSTS** |
| Attribute type | Simple | Data type | Enumeration |
| Camel case | Status | | |
| Definition | A message is either active or cancelled. Notice that a system for delivering messages may operate with a range of other statuses, but outside the system only theses two statuses are valid. | | |
| Values | ACTIVE  CANCELLED | | |

The rest of the property types are skipped intentionally for brevity. The data model is an early draft and a complete feature catalogue is postponed until a more completed data model is ready.

# Data product format

The encoding format for the MARINF product will primarily be XML. The XML must conform to the schemas located here:

<https://github.com/DaMSA/MaritimeInformation/blob/master/schemas/marinf.xsd>

The encoding could also be in JSON for easy integration on web pages.

# Data product delivery

## Request-response

Client uses a MaritimeInformationRequest to request data. The response will be a *MaritimeInformationResponse*. The client will maintain a list of current messages. Either the list can be completely updated by giving no *lastUpdate*, or an incremental list can be received by setting *lastUpdate* to the last time an update was received. The response will contain all updated messages, including cancellations.

**Medium** : Primarily RESTful web service over HTTP. The request must have Content-Type: text/xml or application/json. The response will have the same Content-Type.

## Broadcast

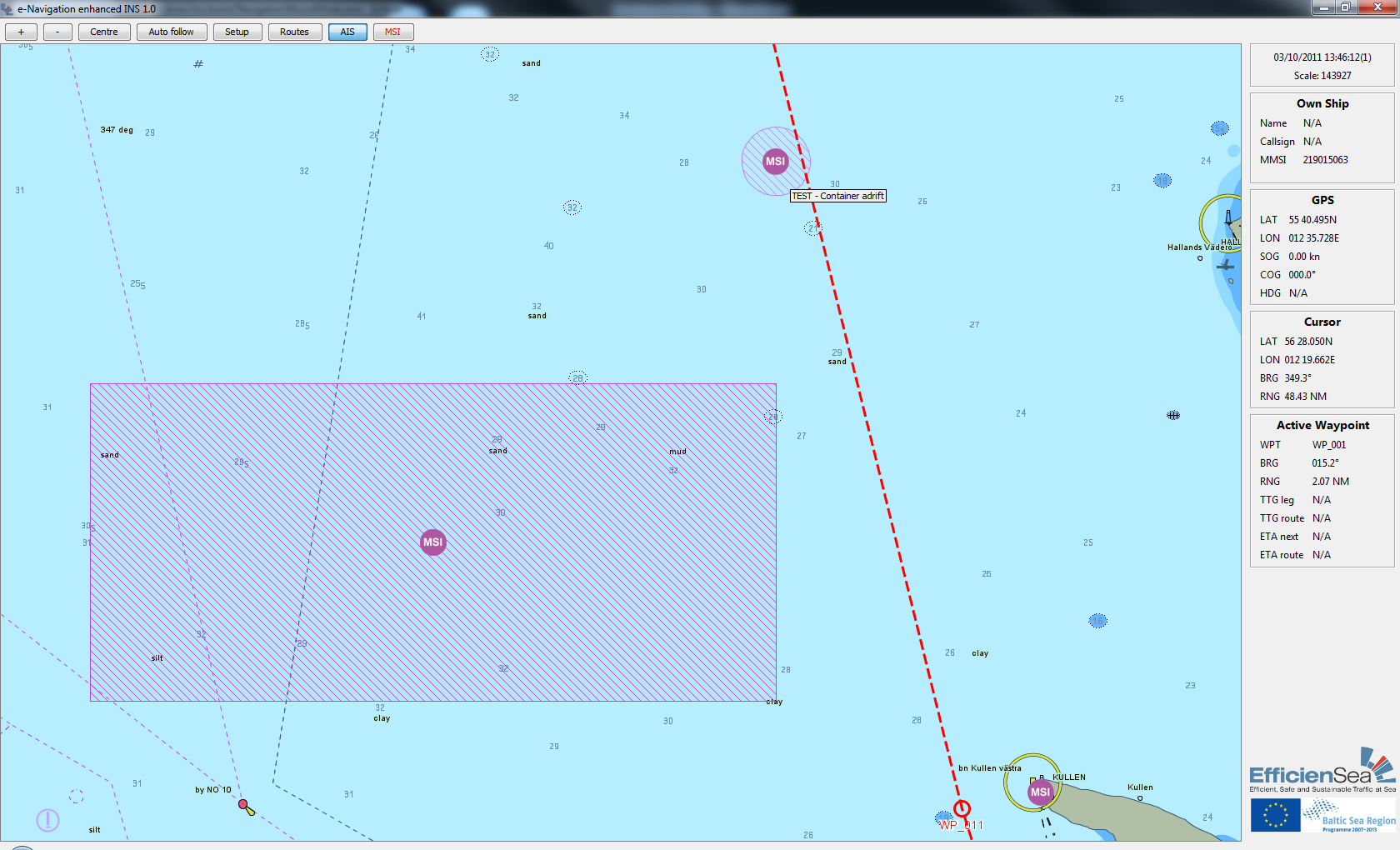
A broadcast of messages is simply a bundle sent to a number of clients. The broadcast will mainly be a list of the current active messages.

**Medium:** HTTP, Email, FTP etc.

# Portrayal

Maritime Information messages should be displayed on navigation displays automatically for correct and immediate assessment by the navigator.

Below portrayal of MSI have been tested by Mariners with good results. A common symbol for MSI messages was used but use of a number of international chart symbols adapted for Maritime Information messages could be the way forward.



*Figure 1: Example of presentation of Maritime Information on navigation display*

# Metadata

Not included in this draft product specification.

# Data quality

Not included in this draft product specification.

# Data capture and classification

Not included in this draft product specification.

# Data maintenance

Not included in this draft product specification.

# Additional information

Not included in this draft product specification.