e-NAV14-13.3.5



**Report of the IALA Workshop**

**on**

**Developing S-100 product specifications for e-Navigation**

Executive Summary

A workshop on the subject of Developing S-100 Product Specifications for e-Navigation was held at IALA between 18 and 21 June 2013.

The workshop was attended by 35 delegates representing 17 countries (see ANNEX A).

A series of 17 presentations were given under three broad headings:

* S-100 & S-101;
* Examples of developing Product Specifications (PS);
* Introduction to the draft Product Specification Guideline;

The workshop then broke into three Working Groups to discuss and then produce guidance under the headings of:

1. Aids to Navigation Information – finalisation of draft PS.
2. Maritime Safety Information & Notices to Mariners – Commence work on a PS.
3. IVEF – review of current draft PS.

The inability of S-100 to handle data streaming emerged as a significant issue.

The social programme consisted of a Welcome Reception and a Workshop Dinner.

The workshop produced:

* 11 conclusions (see ANNEX E).
* takeaway points for both IALA and IHO (see ANNEX F)

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**Developing S-100 Product Specifications for e-Navigation**

# Introduction

A workshop on the subject of Developing S-100 Product Specifications for e-Navigation was held at IALA, between 18 and 21 June 2013. The workshop was attended by 35 delegates representing 17 countries.



A list of participants is at ANNEX A.

All presentations form part of the output of the workshop, posted to the FTP server.

# Session 1 - Opening

Chaired by Bill Cairns, Chairman of the IALA e-NAV Committee and Workshop Chairman.

## Welcome

In his opening remarks, Bill Cairns welcomed all the delegates, observing that there was a good geographical spread and mix of different expertise. The objective of the delegate questionnaire was explained and everyone was encouraged to return it by the end of the afternoon sessions. It was established that no one was currently developing a new Product Specification (PS), other than those already known, but there were indications that some delegates wanted to. The Chairman closed by saying that the results of the workshop were expected to be a significant development in the move towards e-Navigation.

## Administrative and safety information

Administrative and safety information was provided by Mike Hadley, IALA Technical Co-ordination Manager, by means of a presentation.

## Workshop’s aim & objectives

A presentation was made by Nick Ward, GLA R&RNAV and Vice Chairman of the IALA e-NAV Committee. It began with the background of the process by which S-100 became the baseline for data access and services within the scope of SOLAS, thus taking the first step towards a Common Maritime Data Structure (CMDS). The IALA Council has approved an application for IALA to become a submitting organisation and domain owner under the IHO S-100 GI Registry and was subsequently accepted by IHO. This has led to the establishing of the first three domains (AtoN, AIS and VTS), which now need to be populated.

The functions of the workshop and its objectives were outlined concluding with what it was anticipated the workshop would achieve:

* understanding of the IHO GI Registry and Product Specifications;
* experience hands-on development of PS for IALA areas of responsibility;
* build relationships with experts on the topics of this workshop;
* team up with representatives of other countries and organizations.

**The key points of the presentation were:**

1. Introduction.
2. Background.
3. Objectives.
4. What we want to achieve.

## Introduction to the draft IALA Guideline on Developing S-100 Product Specifications for e-Navigation

This topic was presented by Peter Hooijmans, RWS, The Netherlands and Chairman of the IALA e-NAV Committee’s Working Group on Data Modelling.

The Data Modelling Technical Working Group has drafted a guideline on how to develop an IALA S-100 product specification. The presentation took the workshop through the development process of the draft Guideline and also gave a general introduction to it.

**The key points of the presentation were:**

1. Introduction.
2. Objectives of the draft Guideline.
3. The different audiences being addressed.
4. Content of the draft Guideline.

### Discussion

It was asked if the operational services, from which spring the technical services, have been defined. It was explained that e-Navigation is user driven and that process of establishing Maritime Service Portfolios (MSP) is already underway at IMO, via the IMO Correspondence Group (IMO CG) on e-Navigation, and at IALA, although the process is still in its infancy. This prompted the comment that the list of current MSP would be helpful, which led to an impromptu presentation by Jan-Hendrik Oltmann (see section 2.6).

A manufacturer asked whether it was appropriate to prepare a PS for a proprietary system. The answer was that if it was to be widely used an MSP should be developed, from a PS could be derived. It was further commented that an important facet of S-100 is that it establishes a common standard when the user switches service providers.

Then it was asked if the building blocks of S-100 had been established as being suitable for developing a PS. The response was that so far they have but it was agreed that future work may encounter challenges, bearing in mind that the work being contemplated is for an IALA and not an IHO domain. However, this bottom up approach was seen as the best way to proceed.

## Presentation by Jan-Hendrik Oltmann

Jan-Hendrik Oltmann introduced the content of a draft report by the IMO CG to NAV59 and drew special attention to Annex 3 of draft NAV59/6; the document has been added to the workshop reading list, together with some relevant extracts from IMO documents and four e-NAV working papers from the 13th session of the IALA e-NAV Committee. It was noted that the document provided an initial list of all operational and technical services within SOLAS and that it was very much a ‘work in progress’. One operational service could require multiple technical services and the current thinking is that there should one PS for each service involved. Each technical service in the current report could comprise a bundle of services. Finally it was noted that the content of NAV59/6 can be expected to move forward after the meeting of the IMO Sub Committee on Safety of Navigation (NAV) in September 2013.

It was asked who would initiate a PS for an e-Navigation service? IMO has overall governance but cannot undertake the work and so it is expected to assign the work to other relevant bodies, e.g. IALA for AtoN and VTS. It was agreed that a list of such assignments would be useful and it was anticipated that such a list would eventually be compiled.

### Discussion

During the discussion it was noted, that the internationally Maritime Service Portfolios (MSPs), the operational and technical services as well as their respective dependencies and relationships, would greatly facilitate the development of the Common Maritime Data Structure (CMDS), as envisaged by IMO. The MSPs and the services assembled in them would provide the user-need driven requirement base for data modelling. This led to the recognition, that the Maritime Service Portfolios would need to be developed by an appropriate harmonisation group. A small breakout group developed a list of tasks for such a group, which will be further discussed at e-NAV14. Since IMO has governance of their e-Navigation initiative, such a group would be an IMO group or could be undertaken by an international organisation reporting to IMO. Further details to arrive at a fully developed Terms of Reference description for such a group would need to be developed in due course.

Action item

The Secretariat is requested to forward the draft Task Specification for a proposed group on the harmonisation of the international, generic Maritime Service Portfolios to e-NAV14.

# Session 2 – S-100 & S-101

Chaired by Peter Hooijmans

## Presentation S-100, S-101

The presentation was made by Tom Richardson, UKHO.

**Presentation abstract**

S-100 has been developed by IHO and endorsed by IMO as a component of future e-Navigation architecture. This presentation will introduce S-100 describing its content and purpose. S-101 will be used as an example of an S-100 based product specification in order to demonstrate the benefits of this contemporary and flexible data exchange standard.

**The key points of the presentation were:**

1. What is S-100?
2. Why was it developed?
3. What is the current status of S-100 development?
4. What is S-101?
5. What makes S-101 different from S-57 ENC?

### Discussion

The first question was how can IALA learn from the experience gained by IHO, such as that gained by TSMAD? It was advised that IALA is always welcome to attend meetings of TSMAD, bearing in mind the group’s background and that its experience derives from paper charts and S-57 / S52. It was then remarked that TSMAD (Transfer Standard Maintenance and Application Development Working Group) tackles issues in small groups before the result is reviewed by the whole group. It was also noted that, in this context, data modelling is still developing.

Action item

e-Nav14 is requested to consider possible attendance at meetings of TSMAD

It was noted that the product Specification in the ISO 19100 series provides the template for the S-100 PS.

Two suggestions for additional functionality in the S-100 web representation ([registry.iho.int](file:///C:\Doyle\IALA\e-Navigation%20Committee\e-Nav%2014\Input%20papers\registry.iho.int)) were:

* inclusion of a list of PS under development to prevent duplication of effort;
* provision for a catalogue of data objects where existing features (data definitions) can be cross-referenced.

It was stated that a decision has yet to be made about whether S-101 would contain unique identifiers. It was also said that S-52 forms the basis for the S-101 portrayal catalogue, which was undergoing change, but that this would not be too dramatic.

## Presentation on Tooling

The presentation was made by Eivind Mong, Jeppesen, Canada.

**Presentation abstract**

The presentation provided an overview of the tools used for different phases during the development of S-100 PS, based on the experience from ongoing developments.

**The key points of the presentation were:**

1. Conceptual Schema Language.
2. Classes & basic data types.
3. Relationships and associations.
4. Naming and name spaces.

### Discussion

When asked about how best to interact with the ENC, amend it or apply an additional layer, it was commented that one needs to think about the harmonisation of data, the need to avoid duplicating data and minimise areas of overlap. It was felt that there might be a role here for dialogue between IALA and IHO. However, it was acknowledged that a complicating factor is ownership of data.

In response to a query about the availability of proprietary, licensed software, it was said that the active participants in IHO work tend to have their own licensed software.

There was then a discussion about ownership, with the view expressed that globally harmonised data cannot be assigned to a single body. Rather, it was suggested, a stewardship approach will need to be taken, with the support of other stakeholders at the class level. This led to mention of the IMO’s Harmonisation Group on Data Modelling (HDGM). This was another occasion where it was said that the issue would not be resolved during the workshop but was one that would need to be explored at future e-NAV Committee meetings.

## Presentation and demonstration of Enterprise Architect

The presentation was made by Eivind Mong, Jeppesen, Canada.

**Presentation abstract**

This was an overview of how Enterprise Architect is used when developing data models in Unified Modelling Language (UML) for S-100 based product specifications. The presentation started with a highlight of parts of S-100 Part 1, Conceptual Schema Language, which forms the ‘language’ used when expressing concepts in UML.

The presentation was followed by a practical example of the use of Enterprise Architect.

### Discussion

It was said that having looked at a number of product specifications from different domains, it seems that there is little consistency in the naming of primitive type and stereotypes compared to the S-100 standard part 1. The response was that everybody is on a learning curve, and that some clean-up will be needed later on to fully comply with S-100.

An observed inconsistency in the naming of PS was attributed to authors who themselves are still learning about XML.

It was suggested that there is a need for a repository of models and IHO is initiating one; IALA may need to consider opening its own. This prompted the comment that the PS review process should aim at harmonisation and that a technical editor might be beneficial.

It was emphasised that IMO has stated that S-100 (as opposed to the S-100 GI Registry) is the baseline. Although it was observed that this would indicate that boundaries will need to be defined and that, ultimately, all data definitions in S-100 format within the scope of SOLAS may reside, physically, in distributed servers.

End of Day 1

# Session 3 – Examples of developing Product Specifications

Chaired by Jarle Hauge, NCA, Norway.

## AtoN Information PS

The topic was presented by Nick Ward.

**Presentation abstract**

The Aids to Navigation (AtoN) Information Product Specification provides a common structure for the exchange of information about AtoN. This includes buoys, beacons, racons and lights. The product contains the positions, properties, operational status and general comments related to an AtoN.

The Product Specification can be used to exchange AtoN information in a consistent form between Lighthouse Authorities, Hydrographic Offices and other organizations.

**The key points of the presentation were:**

1. Introduction to the AtoN Information PS.
2. Remaining work.
3. Application schema.
4. Data product encoding.
5. Work for the workshop and what can be done later.

### Discussion

The slide stating that Data Product encoding needed to be defined provoked a lively discussion. The implication that it was necessary to decide between XML and GML was disputed. It was suggested that different methods of encoding could be needed for different applications. For example the bandwidth limitations of AIS could dictate a particular form of encoding, whereas a medium without that restriction could benefit from another form. This might lead to several flavours of the same PS (compare with IEC 61162). There was concern that this was going away from harmonisation, but it might be necessary to meet user requirements.

An additional consideration was the need to define the semantics of encoding, not just the syntax. The sentences used in XML should be specified in terms of an e-Navigation Data Exchange format.

Action item

e-NAV14 (WG6) is requested to consider how best to define the semantics of encoding.

It was also noted that submission procedures should include entries for the Feature Concept Dictionary (FCD) and Portrayal Register (PR), as well as the Product Specification itself. The draft PS Guideline and the IHO process flow diagram include generating new entries for FCD/PR, but this needs to be added to the IALA Process.

Action item

Nick Ward is requested to review IALA Guideline No. 1087 on Procedures for the Management of the IALA Domains under the IHO GI Registry and provide an input to e-NAV14.

## IVEF PS

The topic was presented by René Hogendoorn, SAAB, The Netherlands.

**Presentation abstract**

This presentation gave an overview of IVEF. Although an initial product specification has been drafted, there are a number of issues that need to be addressed before it can be finalised. The presentation addressed the following issues:

* Minor:
* Geometries have to conform to the S-100 Feature Classes;
* No portrayal specified.
* Major:
* The present S-100 spec does not support data streaming.

**The key points of the presentation were:**

1. VTS Data Exchange.
2. S-100 Product Specification.
3. S-100 does not currently support Data Streaming.
4. Provision of data at the highest level.

### Discussion

The proposed solution to data loops was to attach the origin to each item and then check whether it had already been transmitted.

With regard to data streaming it became clear that this is not just a challenge for IVEF; it may be faced by other IALA PS, especially in the VTS domain, and is likely to be an issue for the World Meteorological Office. The proposed way to approach the issue was established as IALA (e-NAV Committee), which has access to the relevant expertise, making a very detailed proposal to IHO (TSMAD) and then providing expertise to TSMAD during the required modification to S-100.

When a query about whether the work would be undertaken, it was stated that other change proposals are being progressed and that TSMAD is aware of the data streaming issue and is expecting a change proposal.

The distribution of cargo information within IVEF prompted a discussion about which cargo model is used (currently the UN cargo model but this may change during further development). It emerged that such models ‘belong’ to other bodies, which may be unaware that the IVEF PS is using and possibly modifying their models and that working on the IVEF PS entails translating the model for use with S-100. It was felt that IALA should take the initiative in informing such bodies of the use of their data and perhaps invite them to undertake the translation work themselves. It was suggested that cargo data splits into at least two parts, safety, in which IALA has a legitimate interest, and logistics. It was also suggested that the HGDM would be a tool to take the issue raised forward.

In summary, it was recognized that future S-100 Product Specifications (PSs) currently under consideration at IALA incorporate data objects which are defined in standards prepared, published and maintained by other recognized international organisations, by reference. For example, the Inter VTS Exchange Format (IVEF) standard data model incorporates by reference data modelling on cargo prepared by an appropriate UN body; also, the AIS Application Specific Messages (ASM) as defined by IMO SN.1/Circ.289 contain several data entries which are defined by several international bodies like WMO, for example. To complete an S-100 based product specification, IALA would need to transfer the relevant data objects incorporated by reference into the appropriate S-100 Registers. While this work may be done by IALA faithfully and with the best intentions, IALA recognizes that the full expertise regarding those data objects lies with the international body referenced. Ultimately, IALA will not be able to finalize their Product Specifications unless the data objects incorporated by reference are covered satisfactorily, too. Therefore, it is concluded that

* IALA brings this work to the attention of the appropriate international body as soon as possible after embarking on that work in order to seek advice;
* IALA brings to the attention of the IMO Correspondence Group on e-Navigation that the IMO-MSC adopted IMO/IHO Harmonization Group on Data Modelling (HGDM) (MSC90/28, paragraphs 10.10, 10.12 and Annex 22 refer) should be activated as a matter of urgency; or
* IALA, alternatively, invite IMO to consider the activation of the above HGDM as a matter of urgency at IMO NAV59 directly.

In subsequent discussion it was concluded that the latter approach was likely to be the best option and that this could be achieved by a verbal intervention by IALA and / or national members.

Action items

The Secretariat is requested to inform the appropriate international bodies after the decision to embark on the production of a Product Specification (PS) has been taken and the need for data objects identified.

The Secretariat is requested to bring to the attention of IMO (NAV59) the urgent need to activate the IMO / IHO Harmonisation Group on Data modeling

IVEF is a data-streaming application as opposed to data sets and S-100 in its present form does not allow for data streaming. A proposal needs to be made to TSMAD for a modification to S-100 (the encoding section). This can be done by means of the form in S-100 and IHO would welcome such a proposal.

It was also recognised that XML is bandwidth inefficient. This can be dealt with in a number of ways: link-layer compression, binary XML, attribute filtering or aggregation. Codecs (Code / Decode) can be used for transformations between encodings. Data processing needs to be able to cope with the same data from different sources, by attaching the origin to the data and checking for duplication.

Incorporation of standards by reference was another common theme. For example cargo information could be needed in several different applications and this could relate to safety/security or logistical aspects. Existing standards (UN, FAL) could be referenced, but the owners of the standards should be informed that they are being used, or referenced by a S-100 related PS.

The need to activate the HGDM was cited on several occasions and it was concluded that IALA should bring this matter to the attention of the e-Navigation CG.

# Session 4 – Examples of developing Product Specifications

Chaired by Jarle Hauge.

## AIS Application Specific Messages PS

The topic was presented by Ole Borup, DMA, Denmark.

**Presentation abstract**

S-100 is a standard for making data product; AIS is a communication system. The presentation asked the question if AIS has a place in the S-100 domain. The presentation looked at:

* the data objects in AIS and how they form services;
* how reverse engineering can be used to arrive at an object oriented data model for AIS data and how this can be used to make S-100 product specifications for AIS services;
* how AIS metadata can be standardized using S-100;
* how ASM enables AIS to be used as a general-purpose data carrier;
* example from a user need to an S-100 product specification for a service using AIS.

**The key points of the presentation were:**

1. AIS data and S-100.
2. AIS metadata and S-100.
3. AIS as a general purpose data carrier.
4. e-Navigation services over AIS.

### Discussion

The point was raised, for discussion, that if AIS is a communications system, does it have a place in S-100? Ole Borup said that he had been emphasising the communications aspect of AIS but that it has many other functions. This was followed by the question “Is AIS a suitable carrier between ship and VTS?”

It was asked whether, from experience, there was a view of how new entrants to the world of S-100 found the experience. The reply indicated that it takes time to get to grips with the geographic oriented terminology which is dissimilar to that generally understood by computer scientists. This gave rise to the suggestion that S-100 should contain a statement of the anticipated level of knowledge required by those using it.

Further discussion suggested that perhaps AIS ASM should be considered in parallel with VDES but this was countered by the view that there is something to be gained by tackling AIS services separately. It was then commented that the PS should be more generic, i.e. carrier neutral, something that might apply to other IALA domain PS.

It was then suggested that the topic of routes might be another issue for consideration by the HGDM.

It was observed that a general position service could be realized using different technical services, one of them being through the use of AIS position messages. The general observation was that the services offered by AIS could be generalized into generic operational services that could be realized using different current and future technical services.

It was then asked if a generic PS should be developed to take account of different bandwidths. This was considered possible and a couple of solutions were suggested. This was followed by a proposal that a description of compression needs to be available. This was followed by advice that an AIS ASM PS should be tackled at the application, rather than the link level.

The conclusion was that ASM could be made into an S-100 PS, but the desirability of this was questioned.

It was recognised that AIS was a communications system, not a service in itself. The services for which it is used could be appropriate subjects for S-100 PS, but these should be carrier independent, so the same services could be sent by other means (e.g. VDES, LRIT). It was also recognised that AIS did not entirely follow the OSI layer model, which makes transfer of the services to S-100 more difficult. Any PS might need to be adapted to different communications technologies and so it would be best to avoid specifying link-layer encoding in the PS.

## Ship Reporting PS

The topic was presented by Eivind Mong.

**Presentation abstract**

A report from the 2011 testbed that looked at the feasibility of S-100 to handle non-geographic data, specifically ship reporting data was presented. The Norwegian Coastal Administration (NCA) and Jeppesen conducted the testbed. The report contained the outcome and recommendations for S-100.

**The key points of the presentation were:**

1. Working with S-100 products.
2. Main features of the S-100 data model.
3. Reporting concepts.
4. UML model.
5. XML encoding.

### Discussion

Following the presentation, it was asked what operational service was envisaged and is it implemented. The reply was that the service is Ship Reporting but that it was not yet implemented. It is anticipated that a ship would automatically ‘log in’ on entering Norwegian waters.

It was confirmed that there is no associated testbed; the project was aimed at seeing whether such a PS could be developed.

Queried about whether the absence of detail about the communication link meant that the PS was to be independent of a carrier, the response was yes. Given that reporting is already a required function it is assumed that an appropriate communications means will be available. This aspect of the PS is expected to be taken into account in future development.

It was noted that automatic deconfliction of multiple instances of data from different sources was not straightforward.

# Session 5 – Introduction to the Product Specification Guideline

Chaired by Peter Hooijmans.

## The start; how user need leads to a PS

The presentation was made by Tom Richardson.

**Presentation abstract**

Reflecting principles of user centred design as adopted for e-Navigation this short presentation describes how high level user needs can be captured and translated into specific product requirements. This is demonstrated with the use of a simple example.

**The key points of the presentation were:**

1. How user needs are identified and formalised.
2. How user needs are translated into product requirements.
3. How these requirements can be reflected in product specifications and their data models.

### Discussion

It was admitted that S-100 may not support products but that deficiencies, such as data streaming, would be covered as S-100 evolves.

In response to an enquiry about how necessary it is to get a data model right the first time, the delegates were reminded of something that had been said in the opening session of the workshop, “Don’t get too attached to your data model; it is bound to change”. It was remarked that there may well be more than one ‘right’ model. The advice was to create a model and then test it, treating the development as an iterative process.

When asked how a data model should be tested, it was said that currently this is a paper exercise but that a testbed would be more helpful. As remarked above, it was noted that testing can lead to a structural change in a data model.

## The IALA Product Specification template and how to use the IALA Product Specification template

The topic was presented by Siddi Wouters, Kongsberg Norcontrol IT, Norway.

**Presentation abstract**

The presentation provided an introduction to the IALA Product Specification template, and addressed the main topics and terminology that are part of the template. Furthermore, the presentation provided guidance on how to use the IALA Product Specification template, which was illustrated with examples.

**The key points of the presentation were:**

1. Purpose of the IALA Product Specification template.
2. Main topics and terminology used in the IALA Product Specification template.
3. Relation with the IALA Product Specification process.

### Discussion

Some questions or comments were taken during the presentation.

It emerged that 4 delegates were aware of the template and that, so far, nobody has used it.

It was asked if a unique identifier would be allocated by IALA or part of the proposal? The reply was that the matter has been discussed at IHO and the proposal is that the format of the unique identifier would take the form ‘name + number’ and it was suggested that IALA should consider how to manage this.

It was noted that IHO is developing a feature catalogue tool, which would be available to IALA. In fact it is hoped that IALA would be involved in its testing. Following this it was proposed that the e-NAV Committee should take on the task of deriving a scheme for allocating unique identifications. An IHO demonstration portrayal catalogue is approaching completion and is almost ready for testing.

Data product delivery depends on the end user, such as the ability to digest the size of the input content.

Siddi Wouters encouraged the delegates to use the template. Following which the session Chairman urged the delegates to read the draft Guideline, which includes the PS Template as an Annex and provide feedback.

A scheme was needed for unique IALA Identifiers and e-NAV14 should be tasked to make a proposal.

A Feature Catalogue tool and a demonstration version of the Portrayal Register were to be made available by IHO.

Including Data Product Delivery was optional – depending on the end-user.

Action item

e-NAV14 (WG6) are requested to develop a proposal for the allocation of unique identifies for IALA S-100 PS.

## IALA Domains Management

The topic was presented by Nick Ward.

Before the presentation, the Secretary-General was invited to speak to the delegates. Following a welcome to all the delegates, especially those at IALA for the first time, Gary Prosser thanked the S-100 experts who were enabling the workshop to be held. He then stressed the importance of the work being undertaken, for the future development of e-Navigation. In the remainder of his remarks, he commented that:

* what e-Navigation means is not necessarily clear to the maritime industry;
* there should no expectation of an e-Navigation associated carriage requirement but rather the development of e-Navigation applications;
* he anticipated an enhanced VTS application covering certain critical waterways, as both the number and size of ships can be expected to increase;
* the concept of providing more information to the mariner is not materialising;
* he anticipated shoreside decision support to increase, resulting in the transmission of the distillation of information required by the mariner;
* amongst the goals recently set by the Secretary-General of IMO is, an as yet undefined, marine traffic management;
* he foresaw shared responsibility between ship and shore, rather than as at present, all responsibility resting with the master.

Gary Prosser concluded by saying that he viewed the workshop as a milestone in the development of e-Navigation and wished the delegates well in their deliberations.

**Presentation abstract**

This presentation explained the overall context of IALA’s involvement in the IHO Registry, in particular the move towards a Common Maritime Data Structure (CMDS) and the proposed IMO/IHO Harmonization Group on Data Modelling (HGDM).

The presentation was based on Guideline 1087, which explains the concepts of registries and domains, the responsibility of IHO as manager of the IHO Registry and the role of IALA as a domain owner and manager.

IALA’s roles and responsibilities as a submitting organisation are set out and the process for managing submissions was described.

**The key points of the presentation were:**

1. Common information structure.
2. Common maritime data structure.
3. IHO Registry – common baseline.
4. IALA – IHO flowchart.
5. Planned IALA organisation.

### Discussion

It was asked how industry would submit a PS. It was noted that the flowchart made provision for both IALA Industrial members and non-members to make application. However, during the discussion it was realised that the flow chart failed to take account that all PS submissions need first to be approved by the IHO. Thus there are two routes for submission, direct to IHO or via IALA. For IALA, submission is expected to be on line via the IALA website, something that is already available via the IHO website.

Nick Ward undertook to amend the IALA – IHO flowchart (see page 42 for action).

## Demonstration of the ‘look and feel’ of the registry

The topic was presented by Tom Richardson.

**Presentation abstract**

The IHO GI Registry provides a number of ISO compliant registers for the storage and maintenance of concepts for use in S-100 products. This presentation demonstrated, via the IHO website, the layout of the registers and describe the processes for submission and maintenance as documented in IHO standard S-99 and a dictionary search.

**The key points of the presentation were:**

1. Describe the contents and layout of the GI Registry.
2. Describe the submissions process using a worked example.
3. Description on the contents and use of S-99 in the context of the GI Registry.

### Discussion

Various points emerged from the discussion:

* there is a need for a browsable list of features;
* the current domain approach is tied to management considerations and could be augmented by a user oriented approach;
* could features / attributes be meta data tagged?
* it would be useful to be able to detect the S-100 model linked to a feature;
* how can separate aspects of a feature used in more than one domains be differentiated?
* could a list be flagged to indicate that it needs amending / changing?
* a new feature is likely to be submitted for entry into the Feature Concept Dictionary during the development of a PS and thus is likely to be submitted before the PS.

It was explained that features normally appear only once but they can be updated and therefore can be superseded. It was suggested that this does not suit worldwide use of a feature then this may be an issue that needs to be referred to the HGDM, which may also be the forum for resolving disagreements o about definitions.

The use of metadata tagging and an ontological approach were discussed.

If an invalid object or one subsequently chosen to become invalid is used, its status in the register should not affect the PS.

# Session 6 – Working Group objectives

Chaired by Nick Ward.

## Presentation & discussion of Working Group Objectives

The topic was presented by Nick Ward.

**Presentation abstract**

The presentation set out the objectives of the Working Groups and prompted an open discussion on the way in which the groups will operate and how they will present their results.

The objectives were stated to be:

* Understand Product Specifications (PS) and how to create PS in different domains;
* Create PS templates for real products within the IALA remit;
* Use the Guideline to build these selected applications;
* Understand the process for seeking PS acceptance in the S-100 GI Registry.

The suggested method of working was:

* Agree on the PS to be developed;
* Follow the draft guideline;
* Note any departures from the guideline;
* Note any lessons learnt.

## Presentation of available subjects / divide into working groups

The topic was introduced by Peter Hooijmans.

The proposed working group tasks, which were accepted by the delegates, were:

* Building PS on maritime safety information (MSI) and notice to mariners (NM);
* Completing the AtoN PS;
* IVEF PS.

Following a show of hands, working group rooms were allocated.

End of Day 2

# Sessions 7 to 10 – Working Groups

These sessions were co-ordinated by Peter Hooijmans.

The workshop broke into three Working Groups, to progress the following Product Specifications:

* WG1 AtoN Information Leader: Nick Ward
* WG2 MSI & NM Leader: Ole Borup
* WG3 IVEF: René Hogendoorn

# Session 11 – Reports of Working Groups

Chaired by Bill Cairns.

## Report of Working Group 1 - AtoN Information PS

The WG chair (Nick Ward) explained the background to the development of the AtoN Information PS. The WG then used the template included in the draft guideline on Preparing S-100 Product Specifications to progress the draft PS.

A new draft of the PS was produced by the WG. Completion of the document requires finalisation of the Application Schema. The current version of the schema was presented by Tom Richardson and discussed by the WG. It was agreed that Tom Richardson would prepare a new version after the workshop for distribution and review. Once any further comments have been incorporated, the schema will be formatted for inclusion in the PS, the GML encoding will be generated and the Feature Catalogue completed. The final draft of the PS will then be provided (by NW) as an input document to e-NAV 14.

### Revision of the draft IALA PS template

25 points were noted in the course of the PS review for inclusion in a new version of the template. These are included at ANNEX G.

### Discussion

Nick Ward undertook to provide a revised draft AtoN Information PS as an input to e-NAV14.

It was asked if the data model was harmonised with the Electronic Navigation Chart (ENC). The matter had not been discussed specifically but it did impinge on the work undertaken. However, it is expected that the data model is consistent with ENC. Following this, Tom Richardson undertook to provide a mapping document to assist with consistency checking.

Action items

Nick Ward is requested to provide a revised draft AtoN Information PS as an input to e-NAV14.

Tom Richardson (UKHO) is requested to provide a mapping document to Nick Ward, in time for e-NAV14 (23 – 27 September).

## Report of Working Group 2 - MSI & NM PS

### Working Groups objectives:

* understand Product Specifications (PS) and how to create PS in different domains;
* create PS templates for real products within the IALA remit;
* use the Guideline to build these selected applications and note deviation from guideline;
* understand the process for seeking PS acceptance in the S-100 GI Registry.

### Summary of the way the group worked

The group discussed the user need for the creation of the PS

* service provider:
* combine MSI and NM to allow handling in a single application.
* client:
* same format (Navtex, Safetynet, PDF);
* Geo-reference of MSI and NM.

At a data model meeting the user needs were discussed and new features and types added. It was discussed that from the experience with AIS the use of free text attributes should be avoided whenever possible. If enumeration lists are not sufficient, complex types can be used that allow either the use of an enumerated value or free text.

The registry was searched, to check if the item types where already listed. It was noted that this is tedious work and search tools are important. The data model/application schema was copied to the PS and a start was made on the Feature Catalogue tables for the different item types. Since a lot of information is structured in S-100 and filling tables is tedious work, it was found more efficient if this could be done using a web interface instead of a Word document. An online feature catalogue builder would be most welcome.

A review of the template was undertaken and all the required items studied. There was a discussion about the place for the description of the operational service and the technical services, including functional and user interaction descriptions. It was agreed to use Chapter 9 on portrayal for the symbology used but a complete description of a service would not fit in an S-100 product specification.

The WG then reviewed the encoding part and concluded that if a generic data product format is used, a short description is sufficient. With respect to the data product delivery it was noted that the dataset size etc. is probably not applicable if a generic transfer protocol is used.

All the other fields where then reviewed and studied. The use of separate metadata descriptions was not considered necessary, as it is included in the data model.

### Overview of the PS developed

The PS is about enhancing the MSI and NM information and geo-reference is. So that the receiver of the message can filter it and he will get only the information that is relevant for his area and route.

### Work required for completion

* add all relations to data model;
* use enumerations or structured types where ever possible instead of text attributes;
* service design;
* description of promulgation means.

### Revision of the draft IALA PS template

6 points were noted in the course of the PS review for inclusion in a new version of the template. These are included at ANNEX G.

### Conclusion

It was noted that S-100 is a framework for data exchange and additional architecture components are needed to specify operational e-Navigation services

### Discussion

There was a lengthy discussion about the use of enumeration lists and free text. The topic of the necessity of domains was also raised, with the statement that domains are artificial constructs and that other constructs are available. It was suggested that anyone wishing to change the current approach should make a proposal to TSMAD.

## Report of Working Group 3 – IVEF PS

The working group was tasked with

* review the draft IVEF Product Specification;
* develop a view on data transmission issues;
* develop a view on data streaming as a distribution mechanism within S-100;
* write a proposal for IHO TSMAD to amend the S-100 standard with data streaming distribution.

Due to the limited available time, the first two issues were not considered.

The WG developed the notion of a Streaming Service (SS) as a medium to deliver data in the framework of S-100. The SS is based on a client-server data exchange, where the client takes the initiative to get the data. Extensive discussions resulted in the paper, contained in ANNEX H

This paper should be developed into a proposal to IHO TSMAD, both by correspondence and at e-NAV14, preferably before the TSMAD meeting in April 2014.

Observations:

* the IVEF PS may have to be re-evaluated with respect to section 11-9 of the S-100 standard;
* section 11-13 of the S-100 standard v1.0.0 should be rewritten to take into account the mandatory control and status messages that are needed to setup and maintain a Streaming Service.

The report and associated ANNEX H were reviewed.

Each Working Group leader expressed his thanks to the Working Group participants for their input and hard work.

### Discussion

It was suggested that, amongst other examples, the standards from ITU-T might be relevant to data streaming submission.

It was asked if broadcast delivery had been considered by the WG and in reply it was said that initially this had been discounted. However, further reflection was leading to a re-evaluation of that decision.

The overall assessment was that a good start had been made but that there is still much work to do.

# Session 12 – Lessons learned, Conclusions & closing

Chaired by Bill Cairns.

## Lessons learned regarding the IALA Guideline

This topic was introduced by means of a presentation by Peter Hoojimans.

The comments gleaned from each of the three Working Groups were presented and reviewed. The finalised list is at ANNEX F.

## Lessons learned by the IHO

This topic was introduced by Tom Richardson.

The agreed list of points identified at the workshop that will be reviewed with the relevant IHO bodies are listed as Takeaway Points at ANNEX F.

It was observed that ISO 19135 ((ISO) / IEC TR 19764 – Data elements), to which S-100 is subservient, describes in section 7.4 – Cultural and linguistic adaptability that a register or its contents shall:

* 1. Use identifiers rather than names or abbreviations.
  2. Use a code list instead of free text where a list of permissible values is proposed.
  3. Structure free text data elements in a manner that support multiple languages.

## The Challenge for Data Modelling

This additional topic was introduced by Jan-Hendrik Oltmann. His remarks were based on a paper written jointly with Dr Mathias Jonas, Federal Maritime and Hydrographic Agency, Germany.

In reply to discussions during the opening day (paragraphs 2.5 and 2.6 refer), Jan-Hendrik Oltmann gave another impromptu presentation by summarizing a proposal made in a paper presented at the TRANSNAV2013 Conference, Poland. The paper is entitled ‘IMO e-Navigation Implementation Strategy - Challenge for Data Modelling’ and is available as an output from the workshop. In particular the proposal comprises the following main points:

1. In order to become the core of the IMO envisaged Common Maritime Data Structure (CMDS) the present IHO GI Registry as based on IHO S-100 Standard should be transformed into a universal ‘Marine Information Registry’. That would correlate with the ‘Maritime Service Portfolios Registry’ proposed in the Draft Report of the IMO e-Navigation Correspondence Group to NAV59 (see above).
2. To that end, the structure of Registers should be amended by an ‘Interaction Register’ to contain the descriptions of user interactions with portrayal elements at the Human Machine Interface described in the existing Portrayal Register, by an ‘Exchange Register’ to contain the descriptions of data exchange encoding formats and sentences (syntax & semantics) and - as a future option - by an ‘Requirement Register’ which would contain in a formalized description the internationally recognized user requirements.
3. Since no ‘ownership’ of any element in the S-100 framework exists in the strict sense, that term should be changed to ‘stewardship’.
4. When working with the Registry, the management access should be distinguished from the usage access by application or Product Specification designers who intend to build on existing entries to the Registry, and the access means for management access and usage access should be clearly distinguished. This applies particularly to the web representation of the Registry at [registry.iho.int](file:///C:\Doyle\IALA\e-Navigation%20Committee\e-Nav%2014\Input%20papers\registry.iho.int).
5. While the concept of ‘domains’ may be useful from a Registry management point of view, it is not strictly necessary to designate ‘ownership’ (or ‘stewardship’) as this is a tag contained in each and every entry to the Registry anyway. From a Registry usage point of view, i. e. when accessing the Registry by application or Product Specification designers who intend to build on existing entries to the Registry, the domains concept may be an obstacle even. From a usage point of view, the entry point into the Registry should not be the domains selection but rather the Register selection and a combination of an alphabetical browsing presentation of the entries of a Register in combination with a search capability would facilitate the retrieval of existing entries greatly.
6. If the concept of ‘domains’ should be retained for management reasons, the domain setup should be further developed with a view to fully and systematically map the SOLAS scope, which was defined by IMO to be the scope of e-Navigation, to domains. Thus, the international assignment of responsibilities in the process of the creation of the CMDS may be facilitated.

The full paper forms part of the output from the workshop.

### Discussion

It was suggested that the ideas being forward in the paper be presented to IHO HSSC, which meets in September and for which the deadline for papers is in July. In the course of discussion the current position of the IMO HGDM was outlined and it was indicated that IMO National members and IALA were in a position to seek its activation. Given the tightness of the deadline for submission of papers for NAV59 (26 June 2103) was suggested that this might best be achieved by a verbal intervention during the meeting.

Overall, there was support for this suggestion.

Action item

Jan-Hendrik Oltmann is requested to consider submitting a paper on the ‘Challenge to Data Modelling’ to IHO HSSC.

## Lessons leaned by IALA

The discussion was led by Bill Cairns. The workshop reviewed the list of Takeaway points compiled in the draft report and agreed the final list, which is at ANNEX G.

As a result of the discussion an informal inter-sessional Working Group was established under the leadership of René Hogendoorn, with the purpose of progressing an application to TSMSD for S-100 to be able to accept data streaming.

Action item

René Hogendoorn is requested to lead an informal intersession Working group dealing with an application to TSMAD dealing with data streaming and provide an input to e-NAV14.

## Workshop Conclusions

Draft Conclusions were revised and agreed by the delegates; they are at ANNEX E

## Closing of the workshop

The Chairman thanked everyone for attending and working so hard. He said that the workshop was of great value to the IALA e-NAV Committee and that he hoped that it had been professionally beneficial to all the delegates and that non-members would consider joining IALA, as a result. He felt that significant progress had been made and the work on Product Specifications and the draft Guideline were in good shape for further work at e-NAV14. He then handed over to the Secretary-General.

Gary Prosser said what had been achieved was significant event; an important milestone on the way to the development of e-Navigation. He thanked the delegates, on behalf of the IALA Council, for their contributions and then thanked the Workshop Chair and Vice Chair, the presenter and session Chairs and the Secretariat for producing such a successful event.

The Chairman then wished everyone a safe journey home and declared the workshop closed.

# Social programme

On Tuesday 18 June there was a welcome reception at IALA.

A workshop dinner was held at The Wauthier by Cagna on Wednesday 19 June.

# List of Annexes

1. Participants

A list of participants is at ANNEX A.

1. Working Group Participants

A list of working group participants is at ANNEX B.

1. Programme

A copy of the workshop programme is at ANNEX C.

1. Input Papers

A list of input papers is at ANNEX D.

1. Workshop conclusions

A list of workshop conclusions is at Annex E.

1. Takeaway points

A list of takeaway points for IHO and IALA is at ANNEX F.

1. Suggested changes to the draft Guideline on Producing an IALA S-100 Product Specification

A list of suggested changes is at ANNEX G.

1. Definition of a streaming service

A definition of a streaming service is at ANNEX H.

1. Action Items

A list of action items is at ANNEX I.

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1. Working Group Participants
2. Aids to Navigation Information (AtoN)

|  |  |  |
| --- | --- | --- |
|  | Name | Organisation / Country |
|  | Nick Ward (Leader) | GLA R&RNAV / UK and Ireland |
|  | Bjorn Erik Krosness | NCA / Norway |
|  | David Leewald | USCG / USA |
|  | Tom Richardson | UKHO (& IHO) |
|  | Siddi Wouters | Kongsberg Norcontrol IT/ Norway |

1. Maritime Safety Information (MSI) & Notices to Mariners (NM)

|  |  |  |
| --- | --- | --- |
|  | Name | Organisation / Country |
|  | Ole Borup (Leader) | DMA / Denmark |
|  | Romain Gallen | CTMEF / France |
|  | Peter Hooijmans | Rejkswaterstaat / The Netherlands |
|  | Tuomas Martikainen | FTA / Finland |
|  | Jan-Hendrik Oltmann | German Federal Waterways and Shipping Administration |
|  | Jonathan Pearce | OMC International / Australia |
|  | Eirik Reinsvik | Kongsberg Seatex / Norway |
|  | Felipe Rodriguez | DHN / Venezuela |
|  | Jorge Sanchez-Hernandez | CARIS BV / The Netherlands |
|  | Willner Pino Vegas | DHN / Venezuela |

1. Inter VTS Exchange Format (IVEF)

|  |  |  |
| --- | --- | --- |
|  | Name | Organisation / Country |
|  | René Hogendoorn (Leader) | SAAB / The Netherlands |
|  | Grzegorz Cyrzan | Sprint SA / Poland |
|  | Guilhelm Huard | CLS / France |
|  | Einar Lihovd | Kongsberg Norcontrol IT/ Norway |
|  | Krzystof Mendalka | Sprint SA / Poland |
|  | Eivind Mong | Jeppesen / Canada |
|  | Jose Bencomo | DHN / Venezuela |
|  | Martin Rylander | True Heading AB / Sweden |
|  | Elias Rudberg | True Heading AB / Sweden |
|  | Marco van der Kamp | SAAB / The Netherlands |

1. Workshop Programme

**IALA WORKSHOP**

**ON DEVELOPING S-100 PRODUCT SPECIFICATIONS FOR e-NAVIGATION**



**Date**

18 – 21 June 2013

**Venue**

**IALA**

**St Germain en Laye, France**

**Workshop Programme**

**DAY 1 – Tuesday June 18 2013**

|  |  |  |
| --- | --- | --- |
| **Time** | **Activity** |  |
| **1200 - 1300** | **Registration / Welcome tea or coffee** |  |
| **1300 - 1430** | **Session 1 - Opening of the Workshop** | **Chair: Bill Cairns, USCG, Workshop Chairman** |
| 1300-1310 | Welcome | Bill Cairns |
| 1310-1315 | Administration & Safety Brief | Mike Hadley - Technical Co-ordination Manager, IALA |
| 1315-1330 | Workshop’s aim & objectives | Nick Ward, GLA R&RNAV |
| 1330-1430 | Introduction to draft Guideline | Peter Hooijmans, RWS, The Netherlands |
| 1430-1445 | Break |  |
| **1445 - 1600** | **Session 2 – S-100 & S-101** | **Chair: Peter Hooijmans** |
| 1445 - 1545 | Presentation S-100, S-101 | Thomas Richardson, UKHO |
| 1545 – 1615 | Presentation on Tooling | Eivind Mong, Jeppesen, Canada |
| 1615 – 1700 | Presentation and demonstration of Enterprise Architect | Eivind Mong |
| 1700 - 1720 | Discussion |  |

**1730 – 1930**

**Welcome reception**

**Dress code Business attire**

(Finger food will be served)

**DAY 2 - WEDNESDAY 19 June 2013**

| **Time** | **Activity** |  |
| --- | --- | --- |
| 0900 - 0905 | Administrative Details (as required) | Mike Hadley |
| **0900 - 1230** | **Session 3 - Examples of developing Product Specifications** | **Chair: Jarle Hauge, NCA** |
| 0900-0930 | AtoN Information PS | Nick Ward |
| 0930-0945 | Discussion |  |
| 0945-1015 | IVEF PS | René Hogendoorn, SAAB |
| 1015-1030 | Discussion |  |
| **1030-1100** | **Break** | |
| **1100 - 1230** | **Session 4 - Examples of developing Product Specifications** | **Chair: Jarle Hauge, NCA** |
| 1100-1130 | AIS Application Specific Messages PS | Ole Borup, DMA |
| 1130-1140 | Discussion |  |
| 1140-1210 | Ship reporting PS | Eivind Mong |
| 1210-1220 | Discussion |  |
| **1230 - 1400** | **Lunch & Workshop Group Photograph** | |
| **1400 - 1730** | **Session 5 – Introduction to Product Specification Guideline** | **Chair: Peter Hooijmans** |
| 1400 - 1420 | The start, how user need leads to a PS | Tom Richardson |
| 1420 - 1440 | The IALA Product Specification template and Using the IALA Product Specification template | Siddi Wouters |
| 1440 - 1500 | IALA Domains Management | Nick Ward (Introduction by the Secretary-General) |
| 1500 - 1510 | Demonstration of the ‘look and feel’ of the registry | Tom Richardson |
| 1510 - 1530 | Discussion & feedback from delegates | Peter Hooijmans |
| **1530 - 1600** | **Break** | |

| **Time** | **Activity** |  |
| --- | --- | --- |
| **1600 - 1730** | **Session 6 – Working Group Objectives** | **Chair: Nick Ward** |
| 1600 - 1700 | Presentation & discussion of Working Group Objectives | Nick Ward |
| 1700 - 1730 | Presentation of available subjects / divide into working groups | Peter Hooijmans |

**2000 - 2230**

**Workshop dinner**

**The Wauthier by Cagna**

St Germain-en-Laye

**DAY 3 – Thursday 20 June 2013**

| **Time** | **Activity** |  |
| --- | --- | --- |
| **0900 – 1700** | **Session 7 – 10** | **Chair: Jarle Hauge** |
| **0900 - 1030** | **Session 7 – Working Groups** | **Co-ordinator: Peter Hooijmans** |
|  | WG1 AtoN Information | Leader: Nick Ward |
|  | WG2 Maritime Safety Information (MSI) & Notices to Mariners (NM) | Leader: Ole Borup |
|  | WG3 IVEF | Leader: René Hogendoorn |
| **1030 - 1100** | **Break** | |
| **1100 -1230** | **Session 8 – Working Groups** |  |
| **1230 - 1400** | **Lunch** | |
| **1400 - 1530** | **Session 9 – Working Groups** |  |
| **1530 – 1600** | **Break** | |
| **1600 - 1730** | **Session 10 – Working Groups** |  |

**Free evening**

**DAY 4 – Friday 21 June 2013**

|  |  |  |  |
| --- | --- | --- | --- |
| **Time** | **Activity** |  | |
| **0900 -1030** | **Session 11 – Reports of Working Groups** | **Chair: Bill Cairns** |
| **0900-0905** | Administrative Details (as required) | Mike Hadley |
| **0900-0920** | Report of Working Group 1 | Nick Ward |
| **0920-0940** | Report of Working Group 2 | Ole Borup |
| **0940-10:20** | Report of Working Group 3 | René Hogendoorn |
| **10:20-1030** | Discussion |  |
| **1030 – 1100** | **Break** | |
| **1100 – 1300** | **Session 12 – Lessons learned, Conclusions & closing** | **Chair: Bill Cairns** |
| **1100-1200** | Lessons learned regarding the IALA Guideline | Peter Hoojimans / Jarle Hauge |
| **1200-1215** | Lessons learned IHO | Thomas Richardson UKHO |
| **1215-1230** | Discussion | Nick Ward |
| **1230-1245** | Workshop conclusions and findings | Bill Cairns |
| **1245-1300** | Closing of the workshop | Gary Prosser, IALA Secretary-General |
|  |  | |

**Reading list**

The following documents are suggested for reading before the workshop:

IALA Guideline 1087 Procedures for the Management of the IALA Domains under the IHO GI Registry

IALA Guideline 1088 Introduction to Preparing S-100 Product Specifications Guideline Introduction to Production Specification

Current version of the Draft IALA Guideline on Producing an IALA S-100 Product Specification (available from the FTP server in the Workshop directory)

Connection details for non-IALA members:

Please use ftp:// 194.51.37.52

User name: **ftpworkshop**

Password: **supercell**

1. A background paper on S-100 is available via:
2. <http://www.iho.int/mtg_docs/com_wg/TSMAD/TSMAD_Misc/S-100InfoPaper_FinalJan2011.pdf>

Information on the S-100 GI Registry is available via: <http://registry.iho.int/s100_gi_registry/home.php>

1. Workshop input Papers

Together with the presentations made during sessions 2 – 7, the following papers were input to the workshop:

1. IALA Guideline 1087 Procedures for the Management of the IALA Domains under the IHO GI Registry.
2. IALA Guideline 1088 Introduction to Preparing S-100 Product Specifications Guideline Introduction to Production Specification.
3. Draft IALA Guideline on Producing an IALA S-100 Product Specification.
4. A background paper on S-100 was available via:

<http://www.iho.int/mtg_docs/com_wg/TSMAD/TSMAD_Misc/S-100InfoPaper_FinalJan2011.pdf>.

1. Information on the S-100 GI Registry was available via:

<http://registry.iho.int/s100_gi_registry/home.php>.

2. Workshop Conclusions

|  |  |
| --- | --- |
|  | **Conclusion** |
|  | A proposal needs to be made to TSMAD for a modification to S-100 (the encoding section) to permit data streaming. |
|  | IALA members should be requested to bring the need for the activation of the HGDM to the attention of IMO. |
|  | Any PS may need to be adapted to different communications technologies and specifying link-layer encoding in the PS should be avoided. |
|  | A scheme is needed to establish unique IALA Identifiers in S-100. |
|  | The report of the workshop should be brought to the attention of IMO. |
|  | There is a need to harmonise Maritime Service Portfolios (MSP). |
|  | AIS is a communications system and thus it is the AIS technical services that should be the subject of any PS. |
|  | IALA needs to review its guidance on data quality and data maintenance. |
|  | Universal lists, for example Sea Areas and authorities are necessary to avoid free text fields in item types. |
|  | An unique IALA Identifier should be provided at the start of development of a PS. |
|  | S-100 is a framework for data exchange and additional architecture components are needed to realize operational e-Navigation services. |

Action items

e-NAV14 is requested to develop a proposal for submission to TSMAD for a modification to S-100 (the encoding section) to permit data streaming.

The Secretariat is requested to bring the workshop report to the attention of IMO.

Jan-Hendrik Oltmann is requested to consider how best to Harmonise Maritime Service Portfolios and provide an input to e-NAV14

Nick Ward is requested to review existing IALA guidance on data quality and data modelling for further consideration at e-NAV14

Note.

Some actions that might be expected to have arisen from the Conclusions are already incorporated in the text of the report.

1. Takeaway Points
2. IHO

* IHO to consider the addition of ‘in development’ to the product specification register, as soon as a project on a product specification is launched;

In the interim this may be addressed by publishing an Excel spreadsheet and inviting product specification owners to make submissions;

* IHO to provide S-100 models as XMi files (Enterprise Architect compatible) in appropriate packages and make available from a central S-100 repository;
* IHO to note the wider use of the Registry and S-100 in e-Navigation and consider ways in which they may need to be changed to enable this wider use;

The subject needs consideration by IHO HSSC.

* Encouragement should be given to enumeration types being used to the fullest extent (ISO 19135, paragraph 7.4 – Cultural and linguistic adaptability);
* IHO to provide advice to IALA on the development of extensions to S-100 to reflect streaming data delivery;
* IHO to note the experience of IALA in demystifying S-100 and consider means to clarify the a priori knowledge needed to use S-100;

The IALA Guidelines and planned IHO equivalents should mitigate this issue.

* IHO to clarify the relationship between Domains and item ownership in the GI Registry;
* IHO to consider means to support the reassignment of items to their relevant ‘custodian’ within the Registry.

1. IALA

* IALA notes with appreciation the participation of IHO / TSMAD experts in the workshop and seeks their continued support;
* IALA accepts the TSMAD proposed scheme of identifiers as presented in a draft paper to HSSC;

This allows IALA to define a scheme of identifiers that suits its requirements.

* e-NAV14 (WG6) should prepare a high level proposal for the implementation of data streaming under S-100.

Workshop participants are encouraged to work inter-sessionally before e-NAV14.

* e-NAV14 should investigate bandwidth efficient encodings and develop guidance.
* e-NAV14 (WG6) should be tasked to make a proposal reflecting existing IHO work to establish unique IALA Identifiers in S-100.
* e-NAV14 (WG6) should collate the comments from the three Workshop Working Groups about the draft Guideline on Producing an IALA S-100 Product Specification and amend the draft Guideline accordingly.
* IALA should establish part of its website for the exchange of information about Product Specifications in the S-100 format.
* IALA should encourage the provision of S-100 models as XMi files (Enterprise Architect compatible) in appropriate packages and make available from an IALA S-100 repository.
* IALA Guideline No.1087 on Domain management should be modified to reflect lessons learned from the workshop.
* e-NAV14 should review IALA guidance on data quality and data maintenance in the context of S-100.

Action items

The Secretariat is requested to send a letter of appreciation to IHO for the participation of Tom Richardson and Eivind Mong.

e-NAV14 is requested to develop a scheme of identifiers that will suit IALA S-100 PS.

e-NAV14 (WG6) is requested to prepare a high level proposal for the implementation of data streaming under S-100.

e-NAV14 is requested investigate bandwidth efficient encodings and develop guidance.

e-NAV14 (WG6) is requested to make a proposal reflecting existing IHO work to establish unique IALA Identifiers in S-100.

e-NAV14 (WG6) is requested to collate the comments from the three Workshop Working Groups about the draft Guideline on Producing an IALA S-100 Product Specification and amend the draft Guideline accordingly.

IALA is requested to establish part of its website for the exchange of information about Product Specifications in the S-100 format.

IALA should encourage the provision of S-100 models as XMi files (Enterprise Architect compatible) in appropriate packages and make available from an IALA S-100 repository.

Nick Ward is requested to modify IALA Guideline No.1087 on Domain management to reflect lessons learned from the workshop.

Note.

Some actions that might be expected to have arisen from the Takeaway Points are already incorporated in the text of the report.

1. Suggested changes to the draft Guideline on Producing an IALA S-100 Product Specification

From Working Group 1

1. Template needs a front page. A front page is suggested in the draft PS.
2. Template needs a revision page. A revision page is suggested in the draft PS.
3. Suggestion to remove red text <This clause provides general introductory information about the product specification> directly under 1. Overview.
4. In template chapter 1, references, divide references into ‘normative references’ and ‘informative references’ as is done in the draft PS for AtoN.
5. Suggestion to remove paragraph 1.1.1 from the template.
6. Suggestion to include in template paragraph 1.1.2, the following standard sentence: ‘The following terms and definitions are in addition to those in S-100 Annex A.’
7. Suggestion to remove Classification from template in paragraph 1.1.3.
8. Suggestion to move ‘Identifier’ in template paragraph 1.1.3 upwards to directly under ‘Title’
9. Suggestion to remove the table under Maintenance in paragraph 1.1.3. Instead, add red text for suggestion of the following topics: -who maintains the product specification, - specified review regime, specified procedures.
10. Suggestion to make clear (by font or colour) that text in template under paragraph 1.1.4 is for clarification only. It does not need to be filled in.
11. In chapter 2 of the template in red text, add a reference to table 11-3 in S-100.
12. Suggestion to remove Classification (and the related table) in template in paragraph 3.
13. Suggest to replace ‘imagery based’ to ‘coverage based’ in red text under Chapter 4 Introduction in template.
14. Suggestion to add at the end in red text of chapter 4 (Introduction): ‘For coverage based data see S-100 part 7’.
15. Suggestion to change text in Para 4, application schema from ‘A UML diagram needs to be provided’ to ‘At least one UML diagram (or more) need to be provided’.
16. Suggestion to remove Para 4.1.1 to paragraph 4.1.5.2 under Feature Catalogue, and replace by red text: <Build Feature Catalogue by using Feature Catalogue builder> and add black text:

*Introduction:*

*Name:*

*Scope:*

*Field of Application:*

*Version Number:*

*Version Date:*

*Producer:*

*Functional Language:’*

1. In chapter 4 under ‘Data Product Types’ add in red text ‘This paragraph is optional’.
2. In chapter 4 under ‘Data Product Loading and Unloading’ add in red text ‘This paragraph is optional’.
3. Under paragraph 4 ‘Geometry’ after red text ‘Specify which Level of Geometry is to be used in the product specification and any deviations from these’, add red text ‘, refer to S-100 part 7 paragraph 5.3’.
4. Under paragraph 7 ‘Data Capture and Classification’, add in the red text that this paragraph is optional.
5. Replace title of paragraph 8 in the template from ‘maintenance’ to ‘Data maintenance’ to make it in-line with S-100.
6. Under paragraph 9 ‘Portrayal’ add in red text that this section is optional.
7. Under paragraph 11 ‘Data Product Delivery’, add in red text that this section is optional.
8. Under chapter 12 in the template, the section metadata and the section Annex A need to be separated from each other. These are two different sections.
9. A metadata table has to be added under section 12.

From Working Group 2

1. Elaborate on adding item types to the registries. Provide means to submit or adapt item types with the template.
2. Procedure on getting draft status for a PS.
3. Product specification amendment procedures have to be added.
4. Clearer descriptions of applicable fields in the template.
5. Reference functional description in Annex C.
6. Clarification on the difference between operational services and technical services. Elaborate on section 2.3 from user need to PS. User needs leads to description of operational services that are realized through one or more technical.
7. The metadata part of the product specification template needs to be clarified.
8. Add procedure to the draft Guideline on ‘how’ to register ‘launching projects’.
9. Besides the use of enumeration lists suggest the use of cultural and linguistic adaptability if free text is used.
10. Suggest using Enterprise Architect in the Draft Guideline.
11. Encouragement should be given to the fullest use of enumeration lists (see ISO191937, paragraph 7.4).
12. Definition of a streaming service
13. Scope

This paper defines Streaming Service (SS) as a medium to deliver data in the framework of S-100. The SS that is described in this document is based on a client-server data exchange, where the client takes the initiative to get the data.

References and Standards

The following standards may be relevant when defining an update to the S-100 standard v1.0.0:

ISO-19119 – Services

ISO-19115 – Geographic Information - Metadata

ISO-19128 – Geographic Information - Web Map Server Interface

ISO-19142 - Geographic Information – Web Feature Service

ISO-20022 – Extensible Mark-up Language

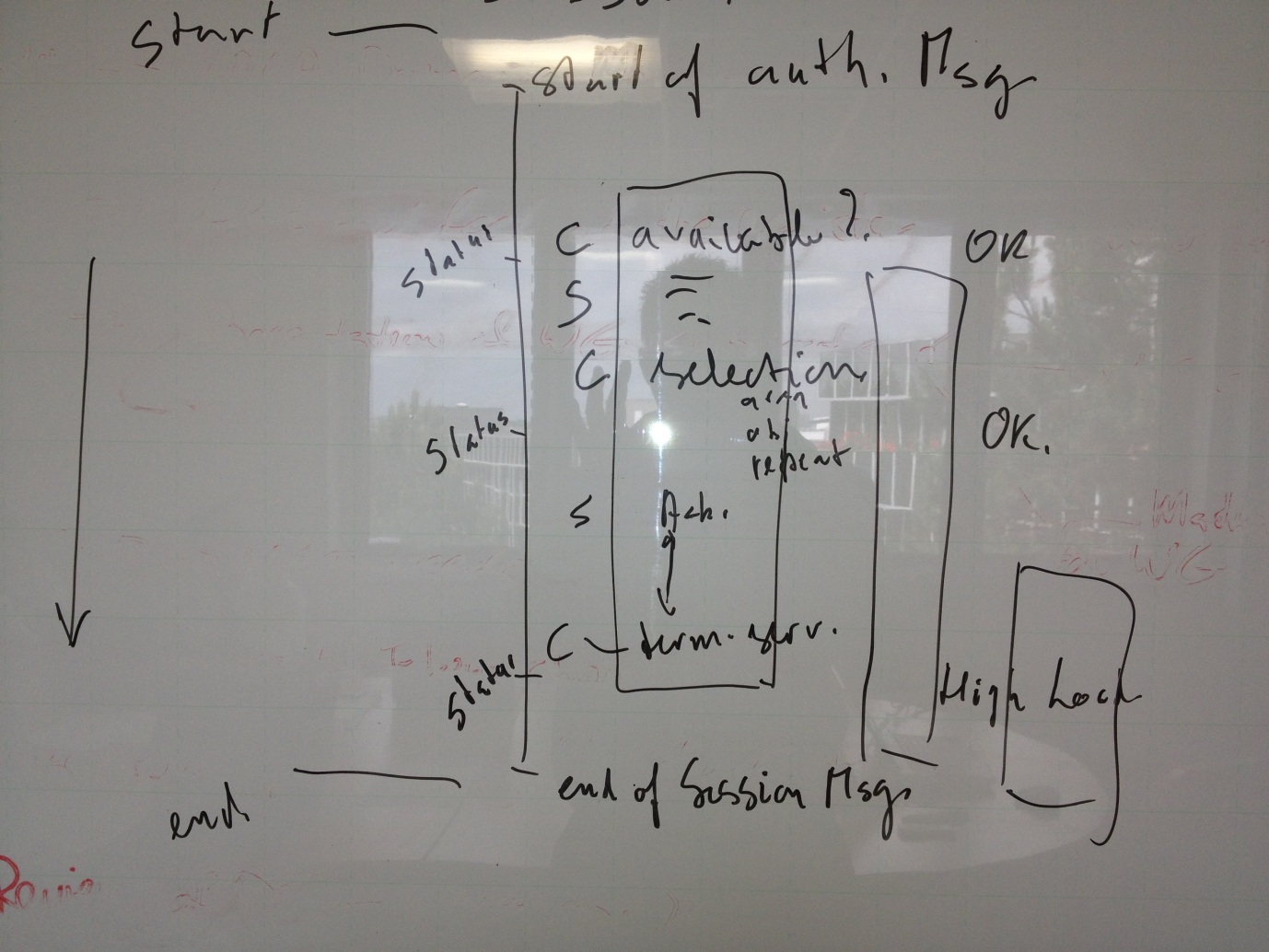
ISO-19136 – Geographic Mark-up Language

1. Definition of a Streaming Service

The following bullet points summarise the main characteristics of a Streaming Service and its foreseen use:

* a basic assumption is the use of a point-to-point connection, where the connection is initiated by the client:
* data connection issues, e.g. maintaining the integrity of data and signalling transmission failure are assumed to be handled by the system providing the connection;
* a new connection implies a new session;
* clients may have several concurrent sessions;
* a disconnection always ends a session.
* session:
* stateful, i.e. the fact that the client did authenticate;
* service profiles established;
* session control and status;
* trust relationship between client and server needs to be setup (confidentiality, accounting);
* service (0 or more).
* definition of the service profile;
* what types of services are available?
* what data is the client allowed to receive?
* what service(s) did the client select (area, type of data)?
* data maintenance.
* single delivery;
* periodic delivery;
* at change.
* every service has a unique identification within the session;
* a service profile may be changed during a session;
* a service can be terminated by the client;
* a client can have no services during a session;
* data delivery according to the defined service profile;
* full data set delivery;
* incremental updates:
* sessions may be terminated by a ‘end session’ message.
  1. Example

The following example illustrates the sequence of events



1. The Relationship with the S-100 Dataset Concept

In a Streaming Service, discovery metadata describes the data available on the server side. The dataset is defined by the service profile as selected by the client. This also means that file-based exchange sets are irrelevant; the data is directly made available by the server. The concept of a service identification replaces the concept of a dataset identification.

Note: the IVEF PS may have to be re-evaluated with respect to section 11-9 of the S-100 standard.

Note: section 11-13 of the S-100 standard v1.0.0 should be rewritten to take into account the mandatory control and status messages that are needed to setup and maintain a Streaming Service.

1. Further remarks

It may be appropriate to consider the delivery of data as a ‘broadcast service’ in addition to data streaming. At the least, it should be considered at the highest level of abstraction.

1. Definition of Terms

‘must’ – mandatory

‘should’ - recommended

‘may’ – optional

Point-to-point connection – a network connection between two communication nodes.

Session – the established connection between client and server, from beginning to end.

Service – the definition of data transfer parameters (such as area of interest) and the subsequent delivery of the data.

Client – the initiator and receiving node of the data stream.

Server – the data stream provider.

Stateful – the history of previous inputs by the client affects the processing of current input; in other words the server keeps track of relevant events that impact service delivery.

1. Actions arising from the workshop

*Actions for the Secretariat*

1. The Secretariat is requested to forward the draft Task Specification for a proposed group on the harmonisation of the international, generic Maritime Service Portfolios to e-NAV14. 6
2. The Secretariat is requested to inform the appropriate international bodies after the decision to embark on the production of a Product Specification (PS) has been taken and the need for data objects identified. 10
3. The Secretariat is requested to bring to the attention of IMO (NAV59) the urgent need to activate the IMO / IHO Harmonisation Group on Data modeling 10
4. The Secretariat is requested to bring the workshop report to the attention of IMO. 39
5. The Secretariat is requested to send a letter of appreciation to IHO for the participation of Tom Richardson and Eivind Mong. 41
6. IALA is requested to establish part of its website for the exchange of information about Product Specifications in the S-100 format. 41
7. IALA should encourage the provision of S-100 models as XMi files (Enterprise Architect compatible) in appropriate packages and make available from an IALA S-100 repository. 41

*Actions for Delegates*

1. Nick Ward is requested to review IALA Guideline No. 1087 on Procedures for the Management of the IALA Domains under the IHO GI Registry and provide an input to e-NAV14. 9
2. Nick Ward is requested to provide a revised draft AtoN Information PS as an input to e-NAV14. 17
3. Tom Richardson (UKHO) is requested to provide a mapping document to Nick Ward, in time for e-NAV14 (23 – 27 September). 17
4. Jan-Hendrik Oltmann is requested to consider submitting a paper on the ‘Challenge to Data Modelling’ to IHO HSSC. 20
5. René Hogendoorn is requested to lead an informal intersession Working group dealing with an application to TSMAD dealing with data streaming and provide an input to e-NAV14. 20
6. Jan-Hendrik Oltmann is requested to consider how best to Harmonise Maritime Service Portfolios and provide an input to e-NAV14 39
7. Nick Ward is requested to review existing IALA guidance on data quality and data modelling for further consideration at e-NAV14 39
8. Nick Ward is requested to modify IALA Guideline No.1087 on Domain management to reflect lessons learned from the workshop. 41

*Actions fore-NAV14*

1. e-Nav14 is requested to consider possible attendance at meetings of TSMAD 7
2. e-NAV14 (WG6) is requested to consider how best to define the semantics of encoding. 9
3. e-NAV14 (WG6) are requested to develop a proposal for the allocation of unique identifies for IALA S-100 PS. 14
4. e-NAV14 is requested to develop a proposal for submission to TSMAD for a modification to S-100 (the encoding section) to permit data streaming. 39
5. e-NAV14 is requested to develop a scheme of identifiers that will suit IALA S-100 PS. 41
6. e-NAV14 (WG6) is requested to prepare a high level proposal for the implementation of data streaming under S-100. 41
7. e-NAV14 is requested investigate bandwidth efficient encodings and develop guidance. 41
8. e-NAV14 (WG6) is requested to make a proposal reflecting existing IHO work to establish unique IALA Identifiers in S-100. 41
9. e-NAV14 (WG6) is requested to collate the comments from the three Workshop Working Groups about the draft Guideline on Producing an IALA S-100 Product Specification and amend the draft Guideline accordingly. 41