**S-100 UnDER KEEL CLEARANCE MANAGEMENT (UKCM) INFORMATION**

**PRODUCT SPECIFICATION**

**PROJECT TEAM (PT) MEETING**

**30 AUG – 1 SEPT 2016**

**SINGAPORE**

**INTRODUCTION**

1. The 7th HSSC meeting held in the Republic of Korea, from 9-13 November 2015 recognised the potential benefits of Under Keel Clearance Management (UKCM) information and endorsed the establishment of an S-100 UKCM Project Team (PT). The subsequent meeting in Singapore was the first meeting of the PT, which was included in the S-100 Working Group work plan.
2. The Singapore Maritime and Port Authority (MPA) kindly agreed to host the inaugural meeting which was chaired and vice-chaired by the Australian Maritime Safety Authority (AMSA).
3. The meeting was held at Orchard Parade Hotel, 1 Tanglin Road, Singapore 247905 from 30 Aug–1 Sept 2016.
4. 16 Members of the PT attended the meeting (see **ANNEX A**).

**OPENING REMARKS**

1. The Chair opened the meeting and welcomed participants, thanking the Maritime Port and Authority of Singapore (MPA) for their support in hosting the meeting and emphasising the importance of this meeting for the PT to fully understand the nature of UKCM and the information needed on board vessels to assist mariners with voyage planning and navigation.

**PROCEDURAL MATTERS**

**Adoption of Agenda**

1. The provisional agenda for the meeting was adopted (see **ANNEX B**).

**MEETING EXPECTATIONS AND scope of the ukcM product specification**

1. The PT reviewed the objective provided in IHO Circular Letter 84/2015 (see **ANNEX C**).
2. The PT agreed to propose to the IHO S-100 WG and NIPWG to include an object that defines the existence, extent and nature of an area that is managed by a shore based UKCM system. This would enable mariners to be aware of UKCM services that are available when planning passages, including planning using ECDIS.
3. It was agreed that the objective of the PT would be to produce a Product Specification (PS) for the key information outputs of shore based UKCM systems, in particular:
   1. A time based layer indicating calculated go/no-go areas, and
   2. Critical UKCM waypoints and their associated tidal windows.
4. Advice provided by C-MAP in developing PSs, highlighted there were three key areas the PT would need to address:
   1. The UKCM Data model,
   2. Associated Metadata, and
   3. How the UKCM data would be packaged.

Action Item:

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| AI 1 – the Chair to propose to the IHO S-100 WG and NIPWG to include information in the relevant standards that define the existence, extent and nature of a shore based UKCM system. |

**Technical presentationS**

1. TRANSAS presented information relevant to their products that deal with UKC (see **ANNEX D**)**.**
2. The PT acknowledged that TRANSAS had provided useful information about the issues involved in providing a UKCM service.
3. The Swedish Maritime Administration (SMA) presented information about the FAMOS project (see **ANNEX E**)**.** The PT noted that the studies took place in the Baltic Sea and aim to improve the quality of hydrographic surveys. One of the key characteristics of the presentation was the use of the geoid as a reference surface and for vessels to be positioned (including elevation with respect to the geoid) using a precision form of Global Navigation Satellite System (GNSS).
4. OMC International (OMC) presented information about the UKCM systems they provide (see **ANNEX F**)**.** The PT understood that this was a general introduction to OMC’s products which are location, vessel and time specific. The presentation discussed the roles of stakeholders in managing UKC including port authorities and terminal operators.
5. The PT noted the range of outputs from various existing UCKM systems that could be considered for inclusion in the Product Specification:
   1. Passage plan/profile
   2. Detailed UKC profile
   3. Information for load planning/vessel optimisation
   4. Sailing windows
   5. Go or no-go seas in 1D and 2D
   6. Information recording for compliance
6. OMC also shared some possible technical and data transfer challenges in facilitating a UKCM Product Specification:
   1. Data products need to be small for ease of transmission to vessel
   2. Real-time aspects
   3. Audit trail
   4. Matching local rules and regulations
   5. Communication links
   6. Available or mandated equipment on board
7. FURUNO presented different methodologies for UKCM services including the pros and cons for each (see **ANNEX G).** The PT appreciated the overview that was presented, which enabled a better understanding of the decision taken at HSSC-7 to produce an S-100 UKCM PS.

**Pt’S RESPONSE TO THE TECHNICAL PRESENTATIONS**

1. The PT agreed UKCM information products should be as small as possible and agreed the focus should be on the output from shore based UKCM services. In particular, the PS should deal with the UKCM information needed by mariners to plan and execute a voyage. In addition, the PT agreed at this stage not to preclude the later inclusion of other UKCM information objects.

**current and in-development s-1xx product specifications and their applicability to ukcm**

1. C-MAP shared the current and in-development S-1xx PS and suggested that the PT could take note of some of the other S-1xx PS that are under development. The PT noted the other S-1xx PS and identified several PS suitable for reference:
   1. S-104 – Tidal Information for Surface Navigation
   2. S-112 – Dynamic Water Level Data
   3. S-124 – Navigational Warnings
2. Korean Maritime and Ocean University (KMOU) shared tables they had produced listing S-1xx, S-2xx and S-4xx PSs which are based on the IHO published list of PSs under development (see **Annex H**). The PT agreed that the more relevant PSs were S-104, S-112 and S-124 as these were related to water level information.
3. Following discussion, the PT agreed to propose to the IHO S-100 WG a number for the UKCM PS could be in the S-12x range, possibly S-128.

Action Item:

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| AI 2 – The Chair to propose to the IHO S-100 WG to allocate S-128 as the number for the UKCM PS. |

**development of a ukcm product specification**

1. The PT agreed that S-122 (Marine Protected Areas) could be used as an example to help inform how the UKCM PS could be written.
2. Options for encoding included ISO 8211 and GML. The PT agreed that it would need to decide on the type of data content and structure first and then determine whether GML or ISO 8211 should be used.
3. The PT agreed to work on three initial topics referring to S-122 for guidance, as follows:
   1. UKCM Use Case and an introduction section for the PS,
   2. Data model and metadata, and
   3. Information portrayal.

**UKCM Use Case and the PS introduction**

1. A UKCM service is one of many different kinds of aids to navigation. It is expected that this PS would apply to UKCM services that are authorised by an appropriate authority (e.g. government or a port). This means that the UKCM meets certain standards for data transparency, availability and quality. The two outputs that were considered are tidal windows at controlling lines for passage planning phases and Go/No-go areas as overlays which provide near real-time information (see **Annex I**).

**Data model and Metadata**

1. An initial data model has been drafted (see **Annex J**). This draft includes an initial Unified Modelling Language (UML) presentation, context tables, different usage cases and examples of how the dataset would behave. The UML source file is also included to enable further editing by the PT.

**Information portrayal**

1. The following time-related objects are recommended to be used for the portrayal of the outputs for UKCM information. They are

(i) Area Overlay and

(ii) Tidal Time Markers (see Annex K).

Action Item:

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| AI 3 – The PT to continue working by correspondence to further develop:  (i) UKCM Use Cases,  (ii) Introduction section for the PS,  (iii) Data model and metadata, and  (iv) Information portrayal. |

**SUMMARY OF meeting OUTCOMES**

1. The inaugural UKCMPT meeting allowed members to gain a common understanding of the nature of UKCM, itemise and discuss many of the associated technical matters and investigate information that may be provided on board vessels that will assist mariners with safe voyage planning and navigation.
2. The PT will seek the allocation of a formal PS number, propose the inclusion of information in the relevant standards that define the existence, extent and nature of shore based UKCM systems and commence the drafting of a proposed UKCM PS.

**Future Work**

1. Based on the success and outcomes of the first UKCM PT meeting, the PT agreed a second meeting will be needed to progress the work.
2. The PT agreed to work referencing the S-10n Product Specification Template and to populate the content of the UKCM PS drawing on the three topics addressed at this meeting.
3. The PT agreed that it would be beneficial for the next UKCM PT meeting to be held in line with the S-100 WG Meeting in March 2017. The proposed date for the second UKCM PT meeting is 13-14 March 2017.

Action item:

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| AI 4 – Chair to provide this report to the Chair of the S-100 WG (for possible tabling at a meeting of the HSSC)  AI 5 – Chair (with the Vice-Chair) to liaise with the Chair of the S-100 WG to plan for the proposed second PT meeting to be adjacent to the S-100 WG Meeting in Italy in March 2017 |

**any other matters**

1. UKCM information outputs to be covered by the PS (e.g. critical locations and tidal windows, and go/no-go areas) were agreed. However, after the meeting it was identified that the UKCM data modelling had not included a UKC ‘value’. This feature will be proposed for inclusion as part of the ongoing work of the PT.

**ADOPTION OF THE REPORT**

1. The PT considered an initial draft version of this report and agreed the Chair and Vice-Chair would complete the draft report and circulate it to all PT participants for their review and comment.

**CLOSING REMARKS**

1. The Chair thanked all participants for making the journey to Singapore and for their enthusiastic inputs during the meeting. On behalf of the PT the Chair thanked Dr Parry Oei for his generous support in hosting the meeting and also the Singapore MPA staff for their tremendous efforts during the meeting.

**NEXT MEETING**

1. The next meeting is proposed to be held in Genoa, Italy on 13 and14 March 2017.

**LIST OF ANNEXES**

Annex A - Participants of the 1st UKCM PT Meeting

Annex B - Meeting agenda

Annex C - IHO Circular letter 84/2015

Annex D - TRANSAS presentation – Draught Information System

Annex E - Swedish Maritime Administration presentation - FAMOS

Annex F - OMC International presentation – OMC Perspective

Annex G - FURUNO presentation – UKCM Pros and cons of different methods

Annex H - IHO published list of product specifications

Annex I - Output of the UKCM Use Case drafting group

Annex J - Output of the Data Model and Metadata drafting group

Annex K - Output of the Information Portrayal drafting group

Annex L - Meeting photos