

**S-101 PROJECT TEAM (S-101PT)**

**7<sup>TH</sup> (REMOTE) MEETING – 18 MAY 2021**

**MEETING RECORD**

<b>S-101PT7 VTC</b> <b>(18 May 2021)</b>
<b>Logistics Information</b>
<b>Main Meeting</b>
Time: 12:00 – 15:00 CEST – (10:00 to 13:00 UTC)
Type: Remote ( <i>Go To Meeting</i> )
Please join the meeting from your computer, tablet or smartphone using the following link;
<b>NOTE: GoTo meeting link for both days: <a href="https://global.gotomeeting.com/join/207170445">https://global.gotomeeting.com/join/207170445</a></b>
<i>Please contact <a href="mailto:jeff.wootton@iho.int">jeff.wootton@iho.int</a> for assistance with connecting to the meeting.</i>

All Papers for the S-101PT7 meeting, including presentations, have been posted on the S-101PT7 meeting page at <https://iho.int/en/s-101pt7-2021>.

**Abbreviations:**

Chair	Tom Richardson	(IC-ENC)
Vice-Chair	Alvaro Sanchez	(Australia)
DG	David Grant	(USA – NIWC)
HA	Hugh Astle	(Teledyne CARIS)
IF	Inga Fjellanger	(Lloyd’s Register)
JP	Jonathan Pritchard	(IIC)
JW	Jeff Wootton	(IHO Sec)
YB	Yong Baek	(IHO Sec)

**Tuesday 18 May 2021:**

**Welcome/Logistics**

The meeting commenced at 1200 CEST. The S-101PT Chair, Tom Richardson, welcomed attendees to the meeting and thanked them for their attendance at the meeting given the short notice; and noted that the intention of this relatively short meeting was to “catch up” on progress made on S-101 development since the previous meeting. He acknowledged the continuing challenges of holding substantive meetings in the ongoing situation of the COVID-19 pandemic and thanked those participants that were attending the meeting from substantially different time zones. He finally passed on condolences on behalf of the PT to US (NOAA) on the recent passing of the US National Hydrographer, RDML Richard Brennan.

Introductory remarks were then made by IHO Director Abri Kampfer. He stressed the importance of S-101 as identified in the S-100 Roadmap; and the importance of the S-101PT in providing input to the development of the “Dual-Fuel” (DF) Concept, which is becoming a high-profile subject in regard to S-100 implementation. He noted the number of attendees and thanked all for attending.

**S-101PT7-01 – Meeting Participants**

The Chair was pleased to acknowledge 49 registered attendees for the meeting. Unfortunately the VTC format for the meeting precluded an “around the table” individual introduction of attendees.

**S-101PT7-02 – Agenda** [Chair]

The meeting Agenda was approved without amendment.

**S-101PT7-03 – HSSC13 Outcomes** [Chair]

[Docs: S-101PT Chair Updates (presentation – slides 2-8)]

The Chair provided a report on the Decisions and Actions from the HSSC13 remote meeting (03-07 May 2021) affecting the S-101PT. He reported that the S-101PT Report to HSSC13 was positively received; and that a number of topics including the “Dual-Fuel” Concept and the way forward to adoption of S-100 Edition 5.0.0 were discussed.

**HSSC13 Decision 13/16:** The Chair noted that there was no further action required of the S-101PT as S-101 Edition 1.1.0 is already aligned in the S-101PT Work Plan with publication of S-100 Edition 5.0.0.

**HSSC13 Action 13/17:** It was noted that requests for IHO funding to support tasks of the S-101PT must be submitted to the HSSC by the S-100WG Chair. A request for funding to support the development of S-164 was submitted by the S-100WG Chair to HSSC13 and this request will be considered by the IHO Secretariat. It was noted that all current S-101 test data was aligned to S-101 Edition 1.0.0 and it is very important that test data aligned to the interim DCEG Edition 1.0.1 (and corresponding Edition 1.0.1 Feature Catalogue – currently under review) is made available as soon as possible in order to facilitate ongoing S-101 Portrayal Catalogue development. Also considered of importance in regard to test data is the availability of “native” compiled test datasets that include encoded examples of S-101 enhanced data modelling that is not included in converted S-57 datasets.

**HSSC13 Decision 13/25:** The Chair noted that there is no impact of this action on the S-101PT as the Work Plan already reflects the requirement of S-101 Edition 1.1.0 to be aligned to S-100 Edition 5.0.0.

**HSSC Action 13/26:** The Chair stated that clarity on the “Dual-Fuel” (DF) Concept is a key dependency in moving forward in the development of S-101 Edition 1.1.0, noting also the Paper that had been submitted to S-101PT6 (S-101PT6-15 from France/Australia – not discussed) related to this issue. He urged PT members to become involved in the development of the DF Concept, in particular the drafting of the DF Concept “Governance” document. It was questioned whether this issue is directly related to ongoing S-98 development. JP responded that the DF Concept is a separate issue that is required to take into account the entire supply chain (the “entirety of ECDIS); from data production to data distribution.

**HSSC Action 13/28:** The Chair thanked S-101PT members for their ongoing contributions to S-101 development, which is acknowledged by the HSSC, noting the concerns that have been raised by the PT in regard to the implications of the development of the DF Concept.

YB noted that any items from the S-101PT that are intended to be raised to the HSSC must be submitted to the next S-100WG meeting, which is scheduled to take place in January 2022 (dates TBC).

**Decisions/Actions:**

**Action S-101PT7-01:** Any S-101PT members interested in contributing to the development of the DF Concept “Governance” document to indicate to the IHO Secretariat ([jeff.wootton@iho.int](mailto:jeff.wootton@iho.int)) at the earliest opportunity. **(S-101PT)**

**S-101PT7-04 – S-101PT6 Report** [Chair]

The report from S-101PT6 was approved without amendment.

## **S-101PT7-05 – S-101PT Actions**

[Chair/IHO Sec]

[Docs: S-101PT Actions @ 20210426 (.xls)]

The Chair stated that the focus on S-101PT Actions for this meeting would be on outstanding S-101PT meeting actions. The Actions relating to the Portrayal Sub-Group would not be discussed, in particular noting the absence of the S-101PT Vice-Chair who is also the Lead of the S-101 Portrayal Sub-Group.

All actions listed as completed/closed in the Actions list were confirmed.

All other Actions from previous meetings remain ongoing. The consolidated Actions list has been updated in accordance with discussions at S-101PT7 and can be downloaded from the S-101 section of the S-100WG page on the IHO web site at <https://iho.int/en/miscellaneous-10>. Actioners were encouraged to review the consolidated Actions list and provide updates to the Chair and IHO Secretariat as required.

DG requested that S-101PT meeting Agenda item numbers are removed from the Action subjects in column 2 of the Consolidated Actions spreadsheet as these are confusing to readers.

### Decisions/Actions:

**Action S-101PT7-02:** References to S-101PT meeting Agenda item numbers to be removed from column 2 of the Consolidated Actions spreadsheet. **(IHO Sec)**

**Action S-101PT7-03:** S-101PT Work Plan to be updated taking into account S-100WG and HSSC approval milestones. **(Chair)**

## **S-101PT7-06 – DCEG Update**

[JW]

[Docs: Draft S-101 Ed. 1.0.2 (clean and redline); Change Control Log (.xls)]

JW reported on the current status of the S-101 DCEG, noting in particular the publication of S-101 DCEG Edition 1.0.1 in March 2021. He further reported that an identified issue with a definition being incorrectly repeated for 2 discrete items in the IHO GI Registry (verticalDatumOfData and verticalDatum) had necessitated an amended definition being applied to verticalDatumOfData in the Registry. This revised definition has been included in the new draft of the S-101 DCEG, however PT members were advised that the resultant change in the Registry will mean that there will be a minor inconsistency between S-101 DCEG Edition 1.0.1 and S-101 Feature Catalogue version 1.0.1.

S-101PT Members were reminded that the DCEG is currently under review and the closing date for this review is 28 May 2021. However JW emphasised that during the implementation and testing phase of S-101 development leading up to Edition 1.1.0 comments are welcome at any time.

The Chair suggested that a review of the structure and content of the DCEG Change Log spreadsheet could be conducted so as to make changes to the DCEG that directly impact on implementers (Portrayal Catalogue developers, production and validation software developers, etc) more prominent. It was agreed that the summary of these changes will be included in the DCEG Document Control page.

JW reported that the S-101 Feature Catalogue version 1.0.1 had been developed, with thanks to RoK, and was currently under review by a small expert group. The deadline for comments is 21 May 2021 (Teledyne CARIS and ESRI both indicated that they will be providing comments) and it is hoped that the Feature Catalogue version 1.0.1 will be published in early June. IF (Lloyd's Register) requested that she be added to the small expert group for the next Feature Catalogue review.

DG questioned whether – through consistent version numbering between the different S-101 components – (or otherwise how) to maintain links between different versions of S-101. The Chair responded that this will be discussed further as development towards S-101 Edition 1.1.0 continues.

### Decisions/Actions:

**Decision:** Changes that directly impact on S-101 implementation are to be included in the DCEG Document Control page.

**Action S-101PT7-04:** Include changes that directly impact on S-101 implementation in the DCEG Document Control page for the next Edition. **(JW)**

**Action S-101PT7-05:** Add IF (Lloyd's Register) to the small "expert group" for future S-101 Feature Catalogue reviews. **(JW)**

**S-101PT7-07 – Portrayal Progress** [Vice-Chair]

Due to the absence of the S-101PT Vice-Chair (S-101 Portrayal Sub-Group lead), the report of portrayal progress was limited to some brief observations from the Chair and comments on S-101 Portrayal Catalogue development progress from DG.

The Chair noted the progress that has been made on the portrayal issues that have been placed in the Portrayal GitHub (old repository: <https://github.com/S-101-Portrayal-subWG>; new repository: <https://github.com/iho-ohi/S-101-Portrayal-SubWG>), and urged Sub-Group members and other S-101PT members to provide their input so as to keep the good momentum going.

DG reported that the NIWC development of the S-101 Portrayal Catalogue has been moved from their internal platform to the IHO GitHub ([https://github.com/iho-ohi/S-101\\_Portrayal-Catalogue](https://github.com/iho-ohi/S-101_Portrayal-Catalogue)); and all open issues are listed in this repository. He further reported that development of Edition 1.1.4 of the NIWC S-101 Portrayal Catalogue, which is nearing completion, will be aligned to DCEG and FC Edition 1.0.0, noting the issues of developing a Portrayal Catalogue aligned with DCEG Edition 1.0.1 discussed earlier in the meeting.

**S-101PT7-08 – Validation Update** [Chair]

[Docs: S-101PT Chair Updates (presentation – slide 11)]

The Chair reported that an initial draft of the S-101 Validation Checks, including as a minimum Critical Checks, has been completed and will be posted on the S-101PT7 meeting page at the conclusion of the meeting; and thanked Denmark, SevenCs, IIC and others for their significant contributions to this effort. He further reported that continued development of the Validation Checks has been effectively put on hold so as to allow more focussed efforts on other aspects of S-101 development, pending the completion of a more stable version of S-101. The reasoning behind this decision is so as to avoid a possible significant amount of redundant work, given that changes to S-101 leading up to the completion of S-101 Edition 1.1.0 may have a significant impact on the Validation Checks.

The initial draft can be accessed from the following link:

[https://iho.int/uploads/user/Services%20and%20Standards/S-100WG/S-101PT7/S-101PT7\\_2021\\_08\\_EN\\_S-101%20Validation%20Checks%20Draft%200.1%2020210407.xlsx](https://iho.int/uploads/user/Services%20and%20Standards/S-100WG/S-101PT7/S-101PT7_2021_08_EN_S-101%20Validation%20Checks%20Draft%200.1%2020210407.xlsx)

**S-101PT7-09 – S-101PT Workplan Update** [Chair]

[Docs: S-101PT Chair Updates (presentation – slides 9-11)]

The Chair reported on S-101 development progress against the S-101PT Work Plan, as had been discussed in agenda items S-101PT7-06 to S-101PT7-08. There were no comments from the floor or amendments to the Work Plan proposed.

**S-101PT7-10 – S-101 Roadmap** [Chair]

[Docs: S-101PT Chair Updates (presentation – slides 12 and 13)]

The chair reported that there has been no further progress on the S101 Roadmap since S-101PT6, however it is intended that this will be a focus for the coming S-101PT intersessional period. He stated that part of this work will be the synergies between the S-101 Roadmap and the work that is being done around ISO 9001 aspects at the HSSC level; and from this perspective it is considered that the involvement of the S-101PT Vice-Chair in the work being done with ISO 9001 will be advantageous.

The Chair reported that there had been no progress made in the establishment of an Outreach Sub-Group as had been discussed at S-101PT6. He stated that activating this Sub-Group in advance of the publication of S-101 Edition 1.1.0 would be advantageous in terms of the development of clear plans and material to support engagement; and asked for volunteers to participate in (and lead) this Sub-Group.

The Chair encouraged members of the S-101PT to contribute to this work.

**Action S-101PT7-06:** PT members interested in participating in the Outreach Sub-Group to notify the Chair by email ([thomas.richardson@ic-enc.org](mailto:thomas.richardson@ic-enc.org)) at the earliest opportunity. **(S101PT)**

#### **S-101PT7-11 – S-101 Issues Log** [Chair]

The chair reported that there had been no further progress or comments received in regard to the S-101 Issues Log.

#### **S-101PT6-12 – Modify TextPlacement to Support Bearing/Distance** [Teledyne CARIS/CA] [Docs: Modify TextPlacement to Support Bearing/Distance (Rev1)]

HA presented the proposal to modify the S-101 TextPlacement cartographic feature to implement a bearing and distance methodology for locating text in relation to an associated feature rather than a fixed position and flip bearing methodology. It is suggested that this implementation will simplify text placement, given the confusion that exists over the current methodology, in particular the application of the flipBearing attribute.

The proposal was well received, although there was some discussion on the possible retention of the flipBearing attribute that reinforced the confusion in regard to the implementation of this attribute. There was also some discussion on the recommendation to amend the textType attribute value 2 (light characteristic) to make this value more generic, which was agreed requires further discussion within the DCEG Sub-Group.

It was also stated that a “default” text position in relation to the feature also needs to be specified if the TextPlacement is not created, with agreement that assurance that this specification is included in S-101 is to be discussed within the S-101 DCEG and Portrayal Sub-Groups.

#### Decisions/Actions:

**Decision:** It was agreed to move forward with the recommendations included in the Paper *Modify TextPlacement to Support Bearing/Distance* at the S-101PT Sub-Group level. Discussion to take into account S-101PT7 discussions regarding the attributes flipBearing and textType; and ensuring a default text placement specification is included in S-101.

**Action S-101PT7-07:** Include the Paper *Modify TextPlacement to Support Bearing/Distance* as a new Issue in the S-101 Documentation and FC GitHub repository (<https://github.com/iho-ohi/S-101-Documentation-and-FC>) for discussion within the DCEG Sub-Group; and the S-101 Portrayal GitHub repository (<https://github.com/iho-ohi/S-101-Portrayal-SubWG>) for portrayal implications. **(JW/AS)**

**AOB** [Chair]

**Next meeting:** To be determined.

In the interim, it is expected that the Sub-Groups will meet via VTC as required.

Appendices:

- A: S-101PT7 Agenda.
- B: S-101PT7 Consolidated List of Decisions and Actions.
- C: S-101PT7 Participants.

**Appendix A – S-101PT7 Agenda**

S101PT7 VTC - Agenda and Logistics Information			
<b>(18 May 2021)</b>			
<b>Logistics Information</b>			
<b>Main Meeting</b>			
Time: 12:00 – 15:00 CEST – (1100 to 1400 BST; 10:00 to 13:00 UTC)			
Type: <i>Go To Meeting</i>			
Please join the meeting from your computer, tablet or smartphone using the following links;			
<b>NOTE: GoTo meeting link:</b> <a href="https://global.gotomeeting.com/join/207170445">https://global.gotomeeting.com/join/207170445</a>			
<i>Please note: This will not be a full S101PT meeting and therefore no voting or administrative changes will be made.</i>			
<i>Please contact <a href="mailto:jeff.wootton@iho.int">jeff.wootton@iho.int</a> for assistance with connecting to the meeting.</i>			
Draft Agenda			
Time	Topics	Document	Issues for discussion and required outcomes
18/05/2020 (12:00 to 15:00 - CET)			
	Participants	S101PT7-1	List of registered participants <b>[Chair]</b>
12:00	Agenda	S101PT7-2	Meeting starts - duration - 3 hours
12:00 -12:05	Welcome /Logistics		Welcome and Logistics <b>[Chair]</b> / <b>[IHO Sec AK]</b>
12:05 - 12:10	HSSC13 Outcomes	S101PT7-3	
12:10 -12:20	S101PT6 Report	S101PT7-4	
12:20 -13:00	S101PT06 Actions	S101PT7-5	Review actions and update as required <b>[Chair]</b>
13:00-13:30	DCEG Update	S101PT7-6	<b>[JW]</b>
	Portrayal Progress	S101PT7-7	<b>[AS]</b>
	Validation Update	S101PT7-8	<b>[Chair]</b>
	Workplan Update	S101PT7-9	<b>[Chair]</b>
13:30-14:00	Break		
	S-101 Roadmap	S101PT7-10	
	Issues Log	S101PT7-11	<b>[Chair]</b> (S-101PT5-12)
	Data Modelling	S-101PT7-12	Modify TextPlacement to Support Bearing/Distance <b>[CARIS]</b>
	AOB		
15:00	Meeting Closes	N/A	

**Appendix B – S-101PT7 Consolidated List of Decisions and Actions**

No.	Agenda	Action	Who
S-101PT7-01	HSSC13 Outcomes	Any S-101PT members interested in contributing to the development of the DF Concept “Governance” document to indicate to the IHO Secretariat ( <a href="mailto:jeff.wootton@iho.int">jeff.wootton@iho.int</a> ) at the earliest opportunity.	S-101PT
S-101PT7-02	S-101PT Actions	References to S-101PT meeting Agenda item numbers to be removed from column 2 of the Consolidated Actions spreadsheet.	IHO Sec
S-101PT7-03	S-101PT Actions	S-101PT Work Plan to be updated taking into account S-100WG and HSSC approval milestones.	Chair
Decision	DCEG Update	Changes that directly impact on S-101 implementation are to be included in the DCEG Document Control page.	
S-101PT7-04	DCEG Update	Include changes that directly impact on S-101 implementation in the DCEG Document Control page for the next Edition.	JW
S-101PT7-05	DCEG Update	Add IF (Lloyd’s Register) to the small “expert group” for future S-101 Feature Catalogue reviews.	JW
S-101PT7-06	Outreach	PT members interested in participating in the Outreach Sub-Group to notify the Chair by email ( <a href="mailto:thomas.richardson@ic-enc.org">thomas.richardson@ic-enc.org</a> ) at the earliest opportunity.	S-101PT
Decision	Text Placement	It was agreed to move forward with the recommendations included in the Paper <i>Modify TextPlacement to Support Bearing/Distance</i> at the S-101PT Sub-Group level. Discussion to take into account S-101PT7 discussions regarding the attributes <code>flipBearing</code> and <code>textType</code> ; and ensuring a default text placement specification is included in S-101.	
S-101PT7-07	Text Placement	Include the Paper <i>Modify TextPlacement to Support Bearing/Distance</i> as a new Issue in the S-101 Documentation and FC GitHub repository ( <a href="https://github.com/iho-ohi/S-101-Documentation-and-FC">https://github.com/iho-ohi/S-101-Documentation-and-FC</a> ) for discussion within the DCEG Sub-Group; and the S-101 Portrayal GitHub repository ( <a href="https://github.com/iho-ohi/S-101-Portrayal-SubWG">https://github.com/iho-ohi/S-101-Portrayal-SubWG</a> ) for portrayal implications.	JW/AS



**Appendix C – S-101PT7 Participants**

<b>S101PT7 VTC Meeting</b> <b>18 May 2021</b>		
<b>List of Participants (18 May 2021)</b>		
MS / Organization	Name	Email
Belgium	Peter Vlietinck	<a href="mailto:peter.vlietinck@mow.vlaanderen.be">peter.vlietinck@mow.vlaanderen.be</a>
Brazil	Ana Mileze	<a href="mailto:ana.mileze@marinha.mil.br">ana.mileze@marinha.mil.br</a>
Canada	Julie Larrivé	<a href="mailto:Julie.Larrivee@dfp-mpo.gc.ca">Julie.Larrivee@dfp-mpo.gc.ca</a>
Denmark	Elizabeth Hahessy	<a href="mailto:elihh@gst.dk">elihh@gst.dk</a>
Denmark	Richard Fowle	<a href="mailto:riafo@gst.dk">riafo@gst.dk</a>
Denmark	Bruno Cardoso	<a href="mailto:bruca@gst.dk">bruca@gst.dk</a>
Estonia	Dana Kuznetsova	<a href="mailto:Dana.Kuznetsova@transpordiamet.ee">Dana.Kuznetsova@transpordiamet.ee</a>
Estonia	Magus Loore	<a href="mailto:Loore.Magus@transpordiamet.ee">Loore.Magus@transpordiamet.ee</a>
France	Christian Mouden	<a href="mailto:christian.mouden@shom.fr">christian.mouden@shom.fr</a>
France	Erwann Herpe	<a href="mailto:erwann.herpe@shom.fr">erwann.herpe@shom.fr</a>
France	Morgane Gaumet	<a href="mailto:morgane.gaumet@shom.fr">morgane.gaumet@shom.fr</a>
France	Nicolas Gabarron	<a href="mailto:nicolas.gabarron@shom.fr">nicolas.gabarron@shom.fr</a>
Finland	Mikko Hovi	<a href="mailto:Mikko.Hovi@traficom.fi">Mikko.Hovi@traficom.fi</a>
Germany	Sylvia Spohn	<a href="mailto:Sylvia.Spohn@bsh.de">Sylvia.Spohn@bsh.de</a>
Germany	Ulrike Assman	<a href="mailto:Ulrike.Assmann@bsh.de">Ulrike.Assmann@bsh.de</a>
Germany	Jochen Ritterbusch	<a href="mailto:jochen.ritterbusch@bsh.de">jochen.ritterbusch@bsh.de</a>
Italy	Valentino Palma	<a href="mailto:valentino_palma@marina.difesa.it">valentino_palma@marina.difesa.it</a>
Japan	Tomonori Hattori	<a href="mailto:ico@jodc.go.jp">ico@jodc.go.jp</a>
Korea (Republic of)	Iji Kim (Izzy)	<a href="mailto:izzykim@korea.kr">izzykim@korea.kr</a>
Korea (Republic of)	HyunSoo Choi	<a href="mailto:troychoi@kriso.re.kr">troychoi@kriso.re.kr</a>
New Zealand	Verena Bosselmann-Borsos	<a href="mailto:VBosselmann-Borsos@linz.govt.nz">VBosselmann-Borsos@linz.govt.nz</a>
New Zealand	Mikus Ranka	<a href="mailto:mikus.ranka@gmail.com">mikus.ranka@gmail.com</a>
Norway	Odd Aage Føre	<a href="mailto:Odd-Aage.Fore@kartverket.no">Odd-Aage.Fore@kartverket.no</a>
Spain	José María Bustamante Calabuig	<a href="mailto:jbuscal@fn.mde.es">jbuscal@fn.mde.es</a>
Sweden	Klas Östergren	<a href="mailto:klas.ostergren@sjofartsverket.se">klas.ostergren@sjofartsverket.se</a>
United Kingdom	Tom Richardson <b>[Chair]</b>	<a href="mailto:thomas.richardson@ic-enc.org">thomas.richardson@ic-enc.org</a>
USA (NOAA)	Megan Bartlett	<a href="mailto:megan.bartlett@noaa.gov">megan.bartlett@noaa.gov</a>
USA (NGA)	Kevin Dickens	<a href="mailto:Kevin.S.Dickens@nga.mil">Kevin.S.Dickens@nga.mil</a>
USA (UNH)	Briana Sullivan	<a href="mailto:briana@ccom.unh.edu">briana@ccom.unh.edu</a>
<b>Expert Contributors</b>		
CSmart (Carnival)	Antonio Di Lieto	<a href="mailto:ADiLieto@carnival.com">ADiLieto@carnival.com</a>
ESRI	Tom De Puyt	<a href="mailto:tdepuyt@esri.com">tdepuyt@esri.com</a>
Furuno	Hannu Peiponen	<a href="mailto:hannu.peiponen@furuno.fi">hannu.peiponen@furuno.fi</a>
Geomod	Jérôme Leroux	<a href="mailto:jleroux@geomod.fr">jleroux@geomod.fr</a>
IALA	Guttorm Tomren	<a href="mailto:guttorm.tomren@kystverket.no">guttorm.tomren@kystverket.no</a>
IIC	Jonathan Pritchard	<a href="mailto:jonathan.pritchard@iictechnologies.com">jonathan.pritchard@iictechnologies.com</a>
IIC	Ed Kuwalek	<a href="mailto:edward.kuwalek@iictechnologies.com">edward.kuwalek@iictechnologies.com</a>
iXblue Defence Systems	Robert Greer	<a href="mailto:robert.greer@ixblue-us.com">robert.greer@ixblue-us.com</a>

KRISO	Sewoong Oh	<a href="mailto:osw@kriso.re.kr">osw@kriso.re.kr</a>
Lloyd's Register	Inga Fjellanger	<a href="mailto:Inga.Fjellanger@i4-insight.com">Inga.Fjellanger@i4-insight.com</a>
NIWC (USA)	Mikan Stamenkovich	<a href="mailto:mikan.stamenkovich@navy.mil">mikan.stamenkovich@navy.mil</a>
NIWC (USA)	David Grant	<a href="mailto:david.grant1@navy.mil">david.grant1@navy.mil</a>
Portolan Sciences	Raphael Malyankar	<a href="mailto:raphaelm@portolansciences.com">raphaelm@portolansciences.com</a>
Primar	Svein Skjaeveland	<a href="mailto:svein.skjaeveland@ecc.no">svein.skjaeveland@ecc.no</a>
SevenCs	Holger Bothien	<a href="mailto:holger.bothien@sevencs.com">holger.bothien@sevencs.com</a>
Teledyne Caris	Hugh Astle	<a href="mailto:Hugh.Astle@Teledyne.com">Hugh.Astle@Teledyne.com</a>
<b>IHO Secretariat</b>		
IHO Secretariat	Jeff Wootton	<a href="mailto:jeff.wootton@iho.int">jeff.wootton@iho.int</a>
IHO Secretariat	Yong Baek	<a href="mailto:ybaek@korea.kr">ybaek@korea.kr</a>
IHO Secretariat	Abri Kampfer	<a href="mailto:abri.kampfer@iho.int">abri.kampfer@iho.int</a>
IHO Secretariat	Kazufumi Matsumoto	<a href="mailto:kazufumi.matsumoto@iho.int">kazufumi.matsumoto@iho.int</a>