5th S-129 UKCM Project Team Meeting
Record of Meeting

1100 – 1400 UTC, 23 March 2022
Virtual (GoToMeeting)

1.1 Introductory remarks and opening of the meeting

The chair opened the meeting at 1100 UTC and welcomed S-129 Project Team (PT) members as well as other delegates from the S-100 Working Group (WG). Refer to Annex A for the list of participants.

During the opening session, the chair provided an overview of the draft meeting agenda (Annex B), which included updates on the PT progress to date, as well as recent S-129 activities by different PT members.

The chair noted that the S-129 PT needs to submit a high-level progress update and plan timeline to the S-100 WG before 28th March 2022. It was thus intended that the draft S-129 plan timeline is reviewed by participating PT members during the meeting.

ACTION PT5-1 – Chair to submit S-129 progress update and plan timeline to S-100 WG Chair

The draft meeting agenda also included a session to identify changes to the S-129 Product Specification (PS) based on the upcoming S-100 Edition 5.0.0. However, it was accepted that the PT may not be able to recognise all necessary updates to the S-129 PS, due to S-100 Edition 5.0.0 not yet being finalised.

1.2 Progress Update

The Chair provided an overview of major progress since S-129 Edition 1.0.0 was published in June 2019 (see Annex C).

While walking through the draft workplan timeline (see Annex D), the Chair highlighted the intention to commence updates to the FC, PC and DCEG in early 2023, after the S-100 Toolkit is updated based on S-100 Edition 5.0.0. However, the Chair also asked the PT if it might be feasible to commence these updates earlier.

Yong Baek (IHO Secretariat) commented that the current version of the S-100 Infra-System is based on S-100 Edition 4.0.0, and that KHOA is currently supporting its updates in line with S-100 Edition 5.0.0. This development is expected to complete by the end of 2022, thereby enabling the use of the updated S-100 Toolkit from early 2023.

Given the S-129 data model relatively not being too complex, it was possible for the FC to be manually updated prior to the S-100 Toolkit's availability. However, Yong recommended the use of the S-100 Toolkit to ensure compliance to S-100.

Eivind Mong (Canadian Coast Guard) also commented that "handmade" FC and PC are possible, but very complicated and thus required much more review, validation, and revisions to resolve any "handmade" bugs.

Yong additionally emphasised that, prior to producing the FC, PC, and DCEG through the S-100 Toolkit, any proposal will need to first be processed and submitted to the IHO GI Registry, so that features can be correctly derived from the Registry, and thus be in line with S-100.

2.1 Presentation: IHO GI Registry Review

The Vice-Chair, as a member of the Domain Control Body (DCB), provided an overview of the concept definition submission process in the Concept Register under IHO's Geospatial Information (GI) Registry. The Concept Register was shown to include various concepts that had been submitted by various S-100 WG members in a broader effort to populate the GI Registry to support all S100-based products.

An existing concept from the Concept Register was shown as an example, highlighting the concept's details that included the concept name, submitting organisation, the approval status by each DCB member.

It was further highlighted that when a new concept is submitted, each DCB member would need to accept, reject, or supplement the concept. Rejection of a concept would need to be reasonably justified, while a DCB member can supplement a concept as a means of suggesting changes to the submitted concept. An example of a supplemented concept was shared with the PT.

The Concept Register's export functionality was also presented and was noted as having aided the Vice-Chair's review of numerous recent concept submissions within the 60-day review deadlines. A list of concepts could be exported from the GI Registry in the form of a Microsoft Excel spreadsheet, containing various details such as concepts' names, status, proposal type, and proposal date.

The Vice-Chair also invited the S-129 PT members to recommend anyone, who may have appropriate experience and expertise to take part in the DCB.

2.2 Presentation: S-129 PT Sharepoint Group

The Vice-Chair introduced the S-129 PT Sharepoint group, which had been set up by the previous S-129 Chair, Nick Lemon, as a platform for information-sharing amongst S-129 PT members.

It was proposed that information and data, especially around S-100 Edition 5.0.0, can be provided through the Sharepoint page for PT members, who may not be able to readily access the information elsewhere.

The Vice-Chair expressed intention of keeping the Sharepoint group up to date as S-129 progresses. In addition to sharing information within the S-129 PT, the Sharepoint group could also help the S-100 WG keep abreast of the PT's work.

PT members were asked if interested in accessing the Sharepoint page. Yong, Eivind, and Svein Skjaeveland (PRIMAR) expressed interest in joining the group. Yong furthermore offered to list the Sharepoint page URL to IHO's S-100 resource page. The Vice-Chair provided the URL to Yong.

The Vice-Chair noted that updates on the Sharepoint page currently do not trigger automatic email notifications to participating members. While the chair and Vice-Chair gain more understanding of Microsoft Sharepoint's features, notifications will be provided manually for the time being.

ACTION PT5-2 – Vice-Chair to provide Yong, Svein, and Eivind with access to S-129 Sharepoint group

2.3 Presentation: S-129 Under Keel Clearance Management Operational Test – Tjeldsundet

Svein provided a presentation on the S-129 Under Keel Clearance Management Operational Test conducted in Tjeldsundet, Norway in December 2021. This Operational Test was part of the S-100 Demonstrator Project, which aims to define how the combined IHO S-100 standards can create considerable value for the maritime industry.

The scope of the S-129 Operation Test was to:

- Produce S-129 data
- Produce other S-1xx product data, and use these as input for S-129 data generation
- Integrate the generated S-129 and other S-1xx data in end-user tool, using the data for voyage planning and execution
- Test the use of a combination of S-1xx products on a single end-user system
- Test S-129 live updates

It was concluded that S-129 was useful for safe passage considerations. More value was added during voyage planning than during voyage execution. During voyage execution, the 1-minute update interval of S-129 data was observed as being appropriate, while the display of non-navigable areas (i.e. "no go" areas) raised navigators' situational awareness. It was also noted that the time factor of S-129 provided a good mechanism for understanding conditions and gaining situational awareness ahead in time.

The following key accomplishments of the S-129 Operational Test were recognised:

- S-129 data calculated using other S-100 products (i.e. S-102 and S-111)
- S-129 used in end-user application, expanding navigable available space
- Reduced sailing distance, due to S-129 enabling shorter route
- Situational awareness improvement
- Voyage planning and execution conducted

Areas of improvement were also acknowledged. It was suggested that usability could be enhanced during voyage planning through more flexibility to allow moving back and forward in time. A proposed solution could be to provide multiple S-129 datasets to encompass a time period (e.g. spanning 3 hours before to 6 hours past time of voyage). Additionally, a preference for the ability to adjust parameters onboard directly in the end-user system was expressed.

Other observations included the following:

- several discrepancies identified between Chapter 7 and DCEG in the S-129 Product Specification
- proposal of a new "not assessed" / "not computed" feature to represent areas covered by S-129 datasets with no bathymetry data available

- the XML-based S-100 data structure is complex
- end user interaction with the product is not standardised – one of the major obstacles in uptake will be how end users can amend voyage plans from their software/ECDIS

ACTION PT5-3 – Chair to amend PS based on S-129 Operational Test findings, particularly to correct discrepancies identified between Chapter 7 and DCEG, with assistance from Svein S

Upon conclusion of the presentation, Svein was asked how interoperability of the different S-1xx products was handled in the Operational Test. Svein explained that the end user could choose which product to display, but some interoperability issues were found due to information overlap/overload. Svein highlighted the importance of having interoperability rules, as well as end user training in such scenarios.

Svein was also asked if there were common, generic issues identified across the different S-1xx products. Svein replied that issues found were particular to each S-1xx product, rather than recurring issues commonly found across them.

Yong raised concern that end users may be confused due to perceived similarities of S-129's no-go and almost no-go areas to S-98's water level adjustment function, and therefore the need for scope clarification in the S-129 Product Specification. Svein and Chris Hens (OMC International) clarified that S-129 contains UKC data already calculated and ready for display on ECDIS, whereas water level adjustments are computed onboard by ECDIS. While this was well understood, the need for clarification in the S-129 Product Specification was emphasised, notwithstanding the low likelihood of end users accessing the Product Specification.

ACTION PT5-4 - Review PS scope in consideration of S-129's similarities to S-98's water level adjustment function

Yong further enquired Svein if future side-by-side tests of S-129 and S-98 might be possible to better understand their respective use cases. Svein commented that this would have to be tested in a future project, as the S-100 Demonstrator Project is nearing completion and resources are unavailable.

The PT agreed that it was important for the issues identified in the S-129 Operational Test to be further discussed and addressed.

2.4 S-129 Data Encryption Discussion

Chris raised a question for the PT on whether S-129 data should be encrypted as per S-100 Part 15 (Encryption and Data Protection). It was pointed out that the S-129 PS does not make a clear mention of encryption requirements. The PT's decision during S-129's early stages was to leave the encryption up to the data producer. Notwithstanding the upside of a more secure product, Chris expressed hesitation due to the overheads associated with managing data encryption, particularly around managing user permits.

Yong indicated that S-129 is a product that provides data in very short, frequent intervals. As S-111 is another product with similar data update intervals, it may be worth contacting the S-111 PT to check their plan regarding data encryption.

Chris sought clarification as to whether S-100 Part 15 mandated data encryption. Yong replied that Part 15 recommends data encryption, but does not mandate it, thereby providing data producers with the option to encrypt their data or not.

Hugh Astle (Teledyne) further pointed out that S-100 Part 15 mandates digital signatures. Meanwhile, S-100 Part 17 (Discovery Metadata for Information Exchange Catalogues) also mandates digital signatures, while data encryption is optional via the "dataProtection" attribute. In Hugh's opinion, as digital signature itself is encrypted, the implementation of digital signature would endow the data producer with technology to encrypt S-129 data too.

Raphael Malyankar (Portolan Sciences) raised the question as to how digital signatures would be handled for sample datasets. Hugh explained that S-100 currently does not clearly define how digital signatures should be applied to samples.

Hugh agreed with Chris' concerns about the overheads involved in complete data encryption and suggested digital signatures could provide a minimum level of data protection. Chris explained that, from a data producer's perspective, digital signature could suffice for protecting S-129 data, compared to other products that may necessitate more stringent data encryption. Hugh concurred that digital signatures may be sufficient for verifying (1) the source of S-129 datasets, and (2) end user "received what was sent".

Chris proposed that the PT considers if/how S-129 data is to be encrypted, and clearly state the requirements in the PS.

ACTION PT5-5 – Chair and Vice-Chair to clarify data encryption requirements in PS, with assistance from Chris H

3.1 "Not Assessed" Area

Discussions continued around the need for a "not assessed" area feature in S-129, as proposed in Svein's S-129 Operational Test presentation. The Vice-Chair noted that UKCM areas usually comprise high-definition bathymetry (as outlined in S-129 PS Section 13.1), and there may not be a need for "not assessed" areas.

Chris explained that in the current S-129 implementation, any area not included in a S-129 dataset as "no go" or "almost no go" is automatically visualised as a "go" area, thus the need for "not assessed" areas to distinctly identify areas without UKC calculations. Furthermore, "not assessed" areas may be applicable in the following scenarios:

1. High-definition bathymetry may not always be available in UKCM areas
2. To reduce UKC computational requirements in certain areas (e.g. very shallow areas well outside normal vessel routes)
3. "Behind the vessel" areas for which UKC calculation is no longer required

Svein added that "not assessed" areas had to be hard-coded during the S-129 Operational Test, and that the test would have been easier had "not assessed" areas been defined in S-129 datasets.

Implementation of "not assessed" will have to be preceded by proposing and adding its definition in the IHO Concept Register. The PT will have to devise and agree on a new feature name and definition, while potentially deconflicting with existing features in other products.

ACTION PT5-6 - Draft feature name and definition for "not assessed" area, and circulate with PT

3.2 Metadata

It was agreed that changes to S-100 metadata based on Edition 5.0.0 will have to be reviewed to determine which metadata to mandate in S-129. It was also noted that the PT will also need to refer to recommendations made by the Data Quality Working Group (DQWG) when doing so. Raphael suggested that once Part 17 is finalised in S-100 Edition 5.0.0, it is circulated alongside its associated UML diagrams to the S-129 PT to gather ideas on which metadata to mandate in S-129.

ACTION PT5-7 - Chair to circulate S-100 Part 17 and associated UML diagrams to PT

3.3 Other Discussions

Near the meeting's conclusion, it was agreed by the PT that the S-129 Operational Test in Norway was a significantly valuable exercise worth highlighting to the S-100 WG. The Chair agreed to provide Julia Powell (S-100 WG Chair) with an update on the test, as well as Svein's presentation slides and test report.

ACTION PT5-8 – Chair to provide Julia Powell (S-100 Chair) with S-129 Operational Test report and outcomes

Before proceeding with any changes to the PS, it was also proposed that the PT check with KHOA, KMOU or KRISO if any S-129/S-100 trials may recently have been conducted in South Korea. The Chair agreed to contact Seojeong Lee at KMOU for any updates.

ACTION PT5-9 – Chair to enquire Seojeong Lee (KMOU) about any S-129 trial/project that may have been conducted in South Korea

3.4 Conclusion & Next Meeting

The PT agreed to call off the planned second meeting on March 24th, as enough discussions and action items were covered in this meeting. Hence, the Chair agreed to gather PT's feedback on the PT workplan and timeline by March 25th, before submission to the S-100 WG Chair.

The next S-100 WG meeting is currently planned to occur during the week starting December 5th in Monaco. This would be an opportunity for an in-person S-129 PT meeting, in conjunction with the S-100 WG meeting.

Prior to the likely in-person meeting in December, the Chair proposed that the PT conduct a lead-up meeting in September/October 2022, based on the expected publication of S-100 Edition 5.0.0 around that time. It is anticipated that this meeting will be more decision-based as the PT becomes more familiarised with Edition 5.0.0.

Annex A

List of Participants:

Name	Organisation
Chris Hens	OMC International
Edward Weaver	WR Systems
Eivind Mong	Canadian Coast Guard
Geun Hong Kim	KMOU
Hugh Astle	Teledyne Caris
Jason Rhee (Chair)	OMC International
Lance Round	WR Systems
Lindsay Perryman (Vice-Chair)	AMSA
Raphael Malyankar	Portolan Sciences
Svein Skjaeveland	PRIMAR
Yong Baek	IHO

Annex B

Draft Agenda for the S-129 Project Team Meeting

(23-24 March 2022)

Venue:

Virtual (GoToMeeting)

Time:

March 23rd: 1100 – 1400 UTC (1200 – 1500 CEST)
(GoToMeeting link: https://meet.goto.com/499779389)

March 24th: 1100 – 1400 UTC (1200 – 1500 CEST)
(GoToMeeting link: https://meet.goto.com/408652693)

Chair: Jason Rhee (OMC International)
Vice-Chair: Lindsay Perryman (AMSA)

Time (UTC)	Tuesday March 23rd (1100 – 1400 UTC)	
1100 – 1130	**Session 1** Welcome Update on progress to date	 (All) (Chair)
1130 – 1245	**Session 2**	
1130 – 1145	S-129 Share Point group overview	(Vice-Chair)
1145 - 1200	Update on recent IHO GI Registry activities	(Vice-Chair)
1200 – 1230	S-100 Demonstrator Presentation/Update	(Svein Skjaeveland)
1230 – 1245	S-129 Data Encryption update	(Chris Hens)
1245 – 1315	**Break**	
1315 – 1400	**Session 3** Identifying and assigning changes to S-129 PS in line with S-100 Edition 5.0.0	 (All)
Time	**Wednesday March 24th (1100 – 1400 UTC)**	
1100 – 1230	**Session 4** (Continued as necessary) Identifying and assigning changes to S-129 PS in line with S-100 Edition 5.0.0	 (All)
1230 – 1300	**Break**	
1300 - 1400	**Session 5** Develop S-129 workplan for Edition 2.0.0	 (All)

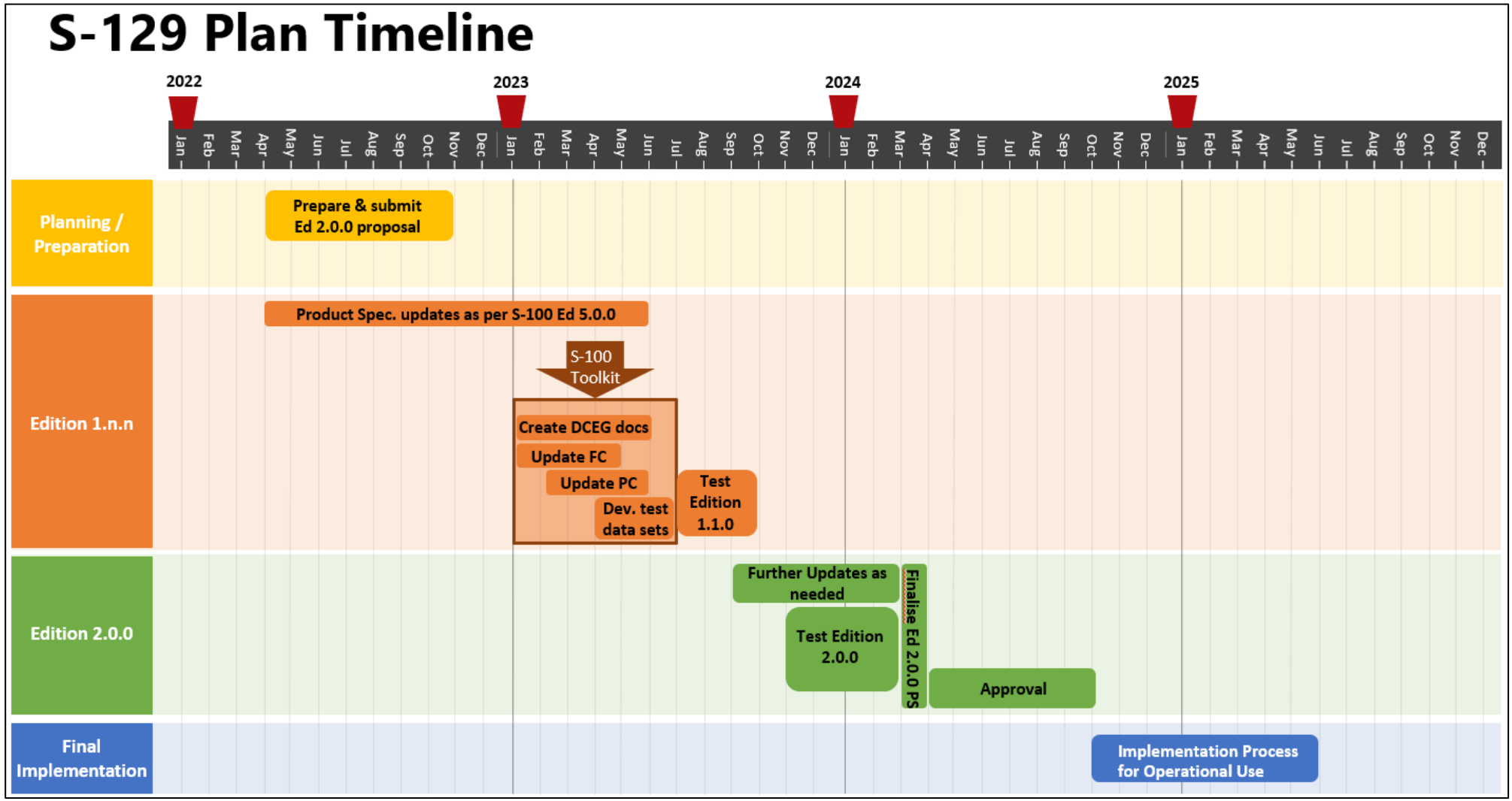
Project team members are requested to provide comments or proposals on any of the agenda items to the PT Chair by no later than 22 March 2022, indicating the relevant Agenda item.

PT Chair: Jason Rhee - j.rhee@omcinternational.com

S-129 Progress to Date - since Edition 1.0.0

Date	Description
Jun 2019	S-129 Edition 1.0.0 published for implementation and testing
Jun – Sep 2019	Testing (KHOA)
Jun-Aug 2020	Testing (NIWC)
Aug 2020	FC & PC revised (KHOA, KRISO)
Oct 2020 – May 2021	Testing (NIWC) – issues found (particularly w/ PC & XSLT files)
(Further development and testing on hold until S-100 Ed. 5.0.0)	
Dec 2021	S-129 Operational Tests, as part of S-100 Demonstrator Project (led by ECC, Kongsberg)

Annex D


S-129 Plan Timeline
2022
2023
2024
2025
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Planning / Preparation
Prepare & submit Ed 2.0.0 proposal
Edition 1.n.n
Product Spec. updates as per S-100 Ed 5.0.0
S-100 Toolkit
Create DCEG docs
Update FC
Update PC
Dev. test data sets
Test Edition 1.1.0
Edition 2.0.0
Further Updates as needed
Test Edition 2.0.0
Finalise Ed 2.0.0 PS
Approval
Final Implementation
Implementation Process for Operational Use

Annex E

5th S-129 UKCM Project Team Meeting - List of Action Items:

Action	Description	Assignee
PT5-1	Submit S-129 progress update and plan timeline to S-100 WG Chair	Jason R
PT5-2	Provide Yong B, Svein S, and Eivind M with access to S-120 Sharepoint group	Lindsay P
PT5-3	Update PS based on S-129 Operational Test findings, particularly to correct discrepancies identified between Chapter 7 and DCEG	Jason R with assistance from Svein S
PT5-4	Review PS scope in consideration of S-129's similarities to S-98's water level adjustment function	Jason R, with assistance from Lindsay P and Yong B
PT5-5	Clarify data encryption requirements in PS	Jason R & Lindsay P, with assistance from Chris H
PT5-6	Draft feature name and definition for "not assessed" area, and circulate with PT for review	Jason R & Lindsay P with assistance from Chris H
PT5-7	Circulate S-100 Part 17 and associated UML diagrams to PT	Jason R
PT5-8	Provide Julia Powell (S-100 Chair) with S-129 Operational Test report and outcomes	Jason R
PT5-9	Enquire Seojeong Lee (KMOU) about any S-129 trial/project that may have been conducted in South Korea	Jason R