
11TH MEETING OF THE COMPLIANCE AND TECHNICAL COMMITTEE (CTC)

Manta, Ecuador, 23-26 January 2024

CTC 11 – Doc 07

Implementation and Operation Report: Commission VMS

Secretariat

This report is provided pursuant to Paragraph 32 of CMM 06-2023 (VMS), which states: *“At each annual meeting of the Commission, the Secretariat shall provide the Commission with a report on the implementation and operation of the Commission VMS”*.

CTC11 is requested to:

- **note** this implementation report and make any recommendations deemed appropriate;

1. Introduction

For authorised vessels operating in the SPRFMO Convention Area, Article 27(1)(a) of the SPRFMO Convention requires that the Commission establish appropriate cooperative procedures for *“... the reporting of vessel movements and activities by a satellite vessel monitoring system that shall be designed to ensure the integrity and security of near real-time transmissions, including through the possibility of direct and simultaneous transmissions, to the Commission and flag State”*.

The application of the Commission VMS is specified in paragraph 2 of CMM 06-2023. *“The Commission VMS shall apply to vessels included in the Commission Record of Vessels Authorised to Fish in the SPRFMO Convention Area. It shall cover the area as defined in Article 5 of the Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean and have a buffer zone of 100 nautical miles outside the Convention Area. The buffer zone shall not apply to vessels flagged to adjacent coastal States fishing in waters under their jurisdiction”*.

The purpose of the Commission VMS is set out in paragraph 4 of CMM 06-2023 *“to continuously monitor the movements and activity of fishing vessels that are on the Commission Record of Vessels and are authorised by Members or CNCPs to fish for fisheries resources in the SPRFMO Convention Area in a cost-effective manner in order to, inter alia, support the implementation of SPRFMO CMMs”*.

2. State of Reporting

Points of Contact:

Pursuant to CMM 06-2023 (Annex 2, paragraph 7), each Member and CNCP shall designate a point of contact for the purposes of any communication regarding the VMS system (including data requests). These points of contact are listed in the Compliance-related sections (VMS Points of Contact tab) on the Members area of the SPRFMO website. In the case of Cuba, which has no vessels in SPRFMO, the Head of Delegation will be the default point of contact.



Method of Reporting:

As per CMM 06-2023, paragraph 9, each Member and CNCP shall require vessels flying its flag to report VMS data to the Commission VMS automatically either:

- (a) to the Secretariat via their Member or CNCP's FMC; or
- (b) simultaneously to both the Secretariat and its FMC.

The arrangement for the majority of the Members/CNCPs is to have the FMC coordinate the reporting of their vessels' VMS positions. All vessels and fleets are now regularly reporting at least once per hour.

Table 1 provides an overview of the reporting selection for each Member/CNCP, and the number of unique vessels reflected in Commission VMS that reported their presence in SPRFMO during the 2021/22 and the 2022/23 reporting periods.

Table 1: VMS reporting for SPRFMO Members and CNCPs

Flag	Type of Reporting (as applicable)	VMS Data in THEMIS – Unique Vessel Count in SPRFMO	
		2021/22	2022/2023 ¹
Australia	Simultaneous	2	2
Belize	Via FMC	0	1
Chile	Via FMC	0	1
China	Via FMC	597	621
Cook Islands	Via FMC	8	5
Cuba	<i>No authorised vsls</i>	0	0
Curaçao	Via FMC	4	1
Ecuador	Simultaneous	0	0
EU	Via FMC	4	7
Faroe Islands	<i>No authorised vsls</i>	0	0
Korea	Via FMC	0	0
Liberia	Via FMC	2	5
New Zealand	Simultaneous	8	8
Panama	Via FMC	84	78
Peru	Via FMC	2	51
Russian Federation	Via FMC	2	3
Chinese Taipei	Via FMC	3	2
USA	<i>No authorised vsls</i>	0	0
Vanuatu	Via FMC	0	14
Total		716	800²

¹ Annex 2 lists, by vessel name, the individual vessels displaying in SPRFMO on Commission VMS during reporting period 2022/23.

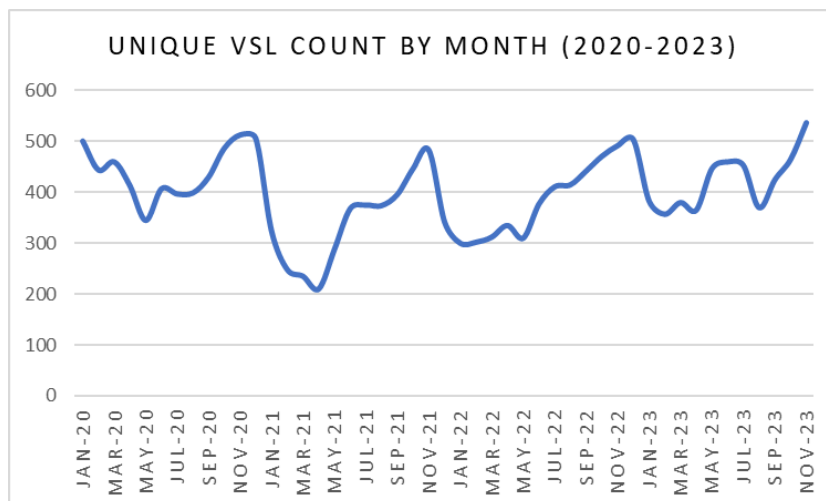
² Vessels that have reflagged during the reporting period may appear with the same name under more than one Member/CNCP. Additionally, if a vessel is renamed, it may appear in the annex under both the former name and the new name.



Vessel Count Fluctuations:

Figure 1 graphically depicts the relative distribution by month of the unique vessels reporting to Commission VMS since the review of VMS data dating back to 2020. Rarely does the number of vessels detected in a month dip below 300 (except covid year 2021) or exceed 500.

Figure 1: Total Unique Vessel Count - Fluctuation by Month (2020-2023)



This data is further refined in Annex 1 to provide a comparative representation of the monthly fluctuation in the Unique Vessel count by Member/CNCP during the 4-year period 2020-2023. The trend emerging is that the “Unique Vessel” count in SPRFMO increases and peaks during the October-December period. This is largely influenced by the movements of the two largest vessel fleets (China and Panama).

Other changes noted that during the 2022/23 reporting period was that the fleet composition in SRFMO reflected a significant increase in the number of Peru artisanal vessels (51) in the SPRFMO Convention Area at various times of the year. Also, the fleet composition has changed somewhat with the addition of sixteen (16) support vessels on the Record of Vessels for Vanuatu and one (1) for Belize.

3. Operation of the Commission VMS

3.1. Personnel

The Commission VMS is primarily managed, and day to day operations overseen, by the Compliance Manager. The Data Manager supports on matters of data integration, data analysis, and report generation.



3.2. Day to day work processes

The Secretariat monitors the VMS system daily, including:

- Monitoring the number and movement of vessels reporting to the Commission VMS.
- Monitoring for data gaps, disruptions, and stoppages to the VMS display on Commission VMS.
- Monitoring VMS for compliance with zone entry requirements and other CMM obligations.
- Investigating system-generated alerts such as:
 - Zone Entry and Exit
 - In-zone VMS cessation
 - Incoherent Data
 - Expired or without authorisation
 - Bottom fishing outside open management areas
 - New beacon identified, not yet associated with a vessel on the SPRFMO Record of Vessels
- Cross-referencing other data holdings with VMS.
- Develop and maintain a filing system to document, track, and report on VMS issues.
- Ongoing communications with VMS points of contact to identify and resolve VMS issues as well as any file follow-up or support for issue resolution.
- Regular communications and virtual meetings with the service provider (CLS) to facilitate product development and troubleshoot reporting or display issues.
- Respond to requests for VMS data, geo-fence areas of interest for reporting and appropriate documentation and follow-up with Members and CNCPs.
- Activating and de-activating polling for vessels³ using Simultaneous reporting.
- Reviewing of bi-monthly invoices covering charges for DNID Upload, Polling, Periodic Rate Change and Position Reports for vessels belonging to Members using simultaneous reporting.

4. Requests for VMS data

Pursuant to CMM 06-2023 VMS data may be obtained by a Member/CNCP for their own vessels (*Paragraph 22*), or under certain circumstances, either requiring or not requiring the consent of the Member or CNCP of the vessels involved.

Additionally, without the permission of the Member or CNCP, the Secretariat can provide VMS data for the exclusive purposes of:

- Planning for active surveillance operations (*Paragraph 24a*)
- Active surveillance operations and/or inspections at sea (*Paragraph 24b*)
- Supporting search and rescue activities subject to the terms of an arrangement between the Secretariat and the competent MRCC (*Paragraph 24c*)

Further, the Secretariat can provide VMS data to a requesting Member or CNCP where the VMS data relates to vessels flagged to other Members or CNCPs that have provided prior written consent through their VMS Point of Contact for the data to be shared (*Paragraph 21*).

A template for data release pursuant to Paragraphs 21, 22 and 24 is available on the non-public section of the SPRFMO website.

VMS data may also be used by the Scientific Committee for analysis to support specific scientific advice requested by the Commission (*Paragraph 8*). A template for such requests is available in the Science area of the SPRFMO website.

³ For Australia and New Zealand



In total, 4 requests were received from 2 Members for access to VMS data during the reporting period Oct 2022-Sept 2023. Each request was received from the relevant VMS Point of Contact using the SPRFMO Request Template and containing the necessary information. All requests were made pursuant to Paragraphs 24a-b (*Planning/Active Surveillance Operations and/or Inspections*). There were no requests for VMS data pursuant to Paragraph 24c (*Search and Rescue*). In all cases, in accordance with Annex 5, Paragraph 5, the Secretariat informed, no later than 7 days after the provision of VMS data, the relevant VMS Points of Contact representing the Member or CNCP of the vessel(s) whose VMS positional data was obtained.

5. Performance of the Commission VMS Service Provider

The Commission VMS service provider is the Collecte Localisation Satellites SAS (CLS) Group, a global company engaged in vessel satellite monitoring. The corporate headquarters and primary VMS Fisheries Monitoring support team are headquartered in France. In January 2021 the parent company transferred the contracts of its customers located in Oceania (*Australia, New Zealand and the Pacific Islands*) to its wholly owned Australian subsidiary, CLS OCEANIA. Invoicing and billing are processed through the Australian office and there are 2 points of contact in Australia to assist with SPRFMO VMS issues. This is in addition to the Fisheries Monitoring Technical Support team based in France.

While there have been some changes at the CLS Technical Support team throughout the reporting period, the SPRFMO Secretariat, CLS Oceania representatives and CLS France representatives (VMS Fisheries Monitoring Support Team) continued email exchanges and holding virtual meetings as needed to facilitate the exchange of information on relevant VMS issues and/or future development needs. This continues to be effective manner to improve communications between the service provider and SPRFMO and having a positive effect on issue identification and resolution.

CLS uses a software known as THEMIS as the base of its Fisheries Monitoring/Management platform. THEMIS was introduced ~ 17 years ago and the software last underwent a major update in 2021 to modernize it and add functionality. CLS continues to move forward with developing an enhanced software platform for the future. The new platform being developed is known as Astrée. As part of this process, CLS conducted client surveys and engaging clients for feedback on their specific usage. The most recent update from CLS is that the new platform will start rolling out in late 2024.

For the calculation of the SPRFMO SLA, the monthly rates shall not include the time spent on planned maintenances. The Service Level Agreement (SLA) stipulates that CLS shall provide a 99.7% fault tolerance for front office. This is calculated monthly and summarized for each 6-month period in the 2 Operating (Service) Reports per year. While there are minor monthly differences between the “real” service and “planned” service availability, CLS has consistently delivered on service availability and above the 99.7% threshold. The average monthly “Real uptime” was 99.98% for the period December 2022 – May 2023 and 99.96% from June to November 2023. (In both reports the “planned uptime” was identified as 99.9%).

Only one major event (impacting availability) was reported by CLS during this period for “Maintenance operations” and that was during the October 2023 scheduled upgrade to THEMIS 8.14.18 to incorporate requested query enhancements. There were issues identified in receiving data from certain countries initially following the upgrade, but this was quickly rectified. On the “IT operations” side there was one major event identified on 16 May 2023 when a database outage was experienced. The time to switch to the secondary Database was estimated to take 5 minutes.



6. Operational Performance of the Commission VMS

Overall performance of Commission VMS for the daily monitoring of active vessels has been good. The application is hosted in the CLS Datacentre and is monitored 24/7 by CLS Operators. In the case of failure, the CLS operators can detect them immediately. Recovery actions are managed on a best effort mode. Generally speaking, the Commission VMS system is an effective tool for monitoring the vessels authorized on the Commission Record of Vessels that are active in the SPRFMO Convention Area and buffer zone on a “near real time” basis.

Notwithstanding, there are always opportunities to seek improvements in the utilization of the tool to streamline and improve application in the SPRFMO context. As reported last year while CLS have been able to assist SPRFMO with some of the more minor requests to improve in areas of reporting or day to day delivery, other requests have been identified as a substantive change requiring dedicated development efforts (and funding) to achieve the deliverables expected.

We were very fortunate in 2023 to utilise a large portion of the funds made available by the United States through the NOAA – SPRFMO MOU for MCS Enhancement work to enhance VMS functionality and improve the Secretariat’s ability to monitor for disruptions and irregularities. Specifically, CLS enhanced THEMIS functionality and reporting for SPRFMO in 3 key areas:

- The development of a report that automatically lists when NAF messages are rejected by THEMIS;
- The development of an automated alert to identify cases where the VMS positional updates cease displaying to Commission VMS while the vessel is within the SPRFMO area; and
- The development of a more comprehensive arrangement of limitation/restrictions on user accounts to better finetune and focus on areas of interest.

The operationalization and finetuning of the use of these new tools by the Secretariat will continue into 2024. Additionally, further training sessions will be planned with CLS to stay current on new functionalities and to aid in the familiarization of the new data manager with THEMIS operations and data.

7. VMS Issues Overview

The purpose of the Commission VMS is to continuously monitor on a “near real-time” basis the movements and activity of vessels authorised by the Members/CNCPs and included on the SPRFMO Record of Vessels. The combination of GPS transponders, satellite receivers, earth receiving stations and automated data forwarding and display programs is quite efficient at tracking vessels at sea and visually displaying a track of vessel positions and movements. However, with millions of VMS positions being transmitted and received over the course of a year it is inevitable that there will be occasional disruptions, gaps, and data abnormalities appearing on the Commission VMS display due to any number of factors.

Generally speaking, most of the disruptions and data gaps are isolated to individual vessels and are for relatively short periods of time with data resuming with minimal intervention from the Secretariat. These disruptions are an issue but, in isolation, have relatively minor impacts on the overall operations and effectiveness of the Commission VMS. While there is need to be documented and followed up with, the more significant issue is when vessels operate for potentially longer periods of time in SPRFMO without VMS being displayed on Commission VMS and/or enter the Convention Area without VMS transmission to Commission VMS.

During the reporting period, except for a few situations, most of these incidents detected are of a relatively short duration, the VMS data has been recovered and individually the incidents have minimal impact on the overall operations of Commission VMS. The specific VMS issues detected, and their causes, are outlined in the VMS section of the Compliance Assessment for review at CTC11.



8. VMS Data Analysis and Support to Other CMMs

As reported last year, in addition to near real-time monitoring of authorised vessels active in SPRFMO, Commission VMS is intended to support the implementation of other SPRFMO CMMs through verification of vessel positional data to corroborate, for example, fishing activity and transshipment data and to monitor compliance. To do this, the Secretariat requires access to the full VMS database, which it does not currently have. The Secretariat has access to the VMS data primarily through the THEMIS platform. THEMIS is a valuable tool for near real-time monitoring of vessel activities; however, the utility erodes quickly when there is interest in time series of positions (even over a few days). It is not possible to query or access large data sets through the THEMIS mapping platform or through the location reports (nor is it possible to cross reference VMS with other SPRFMO data holdings through THEMIS). This limitation poses real challenges for the Secretariat in carrying out their obligations and providing value-added VMS analyses for the Commission.

The Secretariat previously engaged with CLS to find an appropriate solution to this matter in regard to the extraction of large amounts of VMS data. Unfortunately, there is little progress to report this year due to unforeseen events that have delayed any advancement on the data analysis front. Specifically, the notice of departure from the previous SPRFMO data base provider suspended any new development work and necessitated the undertaking of a procurement process for a new SPRFMO Database provider. This process consumed most of 2023. However, the new database provider is now in place and, as of December 2023, the SPRFMO database has been effectively transitioned to the new provider.

Additionally, during the same period there was a change in Data Managers at SPRFMO which necessitated a staffing action resulting in a new Manager, who arrived in Wellington in November 2023. There have also been personnel changes as well on the CLS side.

Notwithstanding, there remains a service request ticket open with CLS concerning the export of large volumes of VMS data into the (new) SPRFMO database, but it has been suspended by mutual agreement until such time that enhancements have been made to the SPRFMO database to accept the VMS data and that the new database manager and database service provider have had an opportunity to engage in the issue. A related companion issue is the ability to integrate other SPRFMO data sources such as Transshipment data such that they data can be cross referenced for analysis.

This remains a project for action but realistically it will likely be delayed until the second half of 2024. In the interim we will continue to use the available data to the best of our ability using manual processes and work arounds to deliver results in key areas.

9. VMS Performance Monitoring and Workplan

Overall, the time spent on Commission VMS continues to be significant. To have an efficient and effective VMS system with reliable information and data it is necessary to have appropriate checks and balances to minimize data gaps and delays in positional information to Commission VMS and to keep abreast of other VMS issues requiring attention (e.g., duplicate vessels, erratic positions, alerts, missing information, etc). The Secretariat continues to work closely with the VMS Service provider and the relevant Member/CNCP VMS Points of Contact to resolve issues and enhance performance of Commission VMS.

Over time, there is every expectation to see a decrease in serious or prolonged incidents requiring Secretariat intervention, however Commission VMS will continue to require a dedicated focus, spot checks, and daily quality control to ensure it meets the threshold of continuous monitoring of SPRFMO vessels. It is expected that some of this workload will decrease with the enhancement of the tools to detect irregularities and the automation of things such as data verification checks and cross-referencing of data sources.

The development and reporting on indicators of VMS performance such as data gap analysis for missing and delayed VMS reports continues to be a viable concept but has been delayed in implementation for the reasons



noted in section 8. The sections outlined last year in the workplan continue to be the guiding principles for the Secretariat in respect to Commission VMS.

These include a focus on identifying:

- SPRFMO vessels in the Convention Area without displaying VMS;
- VMS Gaps - Missing and Incomplete VMS data;
- Situations with delayed receipt of VMS data;
- The cause of disruptions and other VMS vessel related issues;
- VMS system (THEMIS) or Administrative Issues impacting performance or efficiency.

10. Updates and Observations

10.1. Skywave VMS Units

As reported last year there have been some challenges with respect to the VMS connectivity for vessels reporting simultaneously to the Secretariat and the FMC. Even with the intervention of CLS, there have been delays in connecting/reconnecting vessels. This was particularly noticeable when ALC units were updated, service providers changed and/or a move away from the more traditional Inmarsat-based units (e.g., Iridium or Skywave based units).

While initial issues with connecting Iridium based units appears to be resolved by having the service provider include Commission VMS in the data distribution, the issue with respect to SKYWAVE remains unresolved. After obtaining an access ID/user password and engaging CLS it was thought that there may have been a work around involving another receiving station configured for SKYWAVE and then a conversion of data for inclusion into THEMIS. Unfortunately, this did not materialize as being a “shared user” was not a viable option. It was determined that the work around would only work if the SPRFMO account was the only one that the beacon reported too and this is not the case. The vessel in question is a research ship carrying out a limited duration plankton survey. It was not reasonable nor practical to implement a different or separate VMS arrangement.

10.2. Ships on Government Service

The current vessel monitoring situation essentially is premised on the concept that if the vessel is on the Commission Record of Vessels and is currently authorized then the vessel must report its movements whenever it is within the geographic parameters of the SPRFMO Convention Area or the 100nm buffer zone extending beyond the Convention Area (*excepting the carve out for vessels of a coastal state operating within their own EEZ*). A Member’s authorised vessels may include all types of vessel fishing, or supporting fishing, in SPRFMO including “Ships on Government Service” such as research vessels. The Commission Record of Vessels currently identifies 6 authorised vessels as “Fishery Research Vessels” (AUS-1; CHL- 1; NZ-1; and PER-3).

It may be coincidence, but there have been issues identified, in connecting with research vessels and/or in determining if these vessels are reporting while operating in SPRFMO. In some cases Member FMC may not be responsible for the collection and distribution of VMS for government (including military) vessels. Additionally, as these vessels are multi-functional, they may be carrying out research or other work unrelated to SPRFMO.

Examples of potential VMS issues involving “Research Vessels” include:

- Australia: an Australian research vessel, carrying out a short plankton survey, was using a SKYWAVE IDP VMS unit and was unable to be connected to Commission VMS to provide direct positional updates. Following attempts at a work around, CLS advised that the connection was only possible if the SPRFMO account was the only one to which the beacon reported, hence could not be connected through the alternate arrangement.



- Chile: a Chilean research vessel is reported in the SC11 Report to have been engaged in research activity on the Salas y Gomez ridge. During the past 3 years, there has not been any VMS positional data displaying on Commission VMS for this vessel.

- New Zealand: the VMS reconnection to a research vessel, after a period of inactivity in SPRFMO, took multiple weeks to resolve and required a THEMIS update and reload of the DNID to establish connectivity. When the connectivity was finally restored there was an error in the polling frequency that resulted in higher than expected polling and higher than expected invoicing (this issue was resolved, and the polling rate reset).

- Peru: at least one of the Peru research vessels is a Navy ship and as such does not report to, nor is tracked by, the FMC that provides SPRFMO with the fishing vessel activity. Hence, there is currently no relay of VMS positional information to Commission VMS if this vessel is in the Convention Area. During the past 3 years, there has not been any VMS positional data displaying on Commission VMS for any of the Peru research vessels (noting that 2 vessels may have been focused on inshore programming).

The situations above are raised as a matter of awareness. There may need to be future reflection on whether the current overarching VMS requirements are a good fit for Research Vessels and/or if there are other considerations that may need to be taken into account with respect to “Ships on Government Service”. These situations have not been a high priority but do illustrate the need to continue to fine-tune and adapt the VMS programme as/if required.

10.3. Vessels operating in SPRFMO without being displayed on Commission VMS

Again, this year, there have been several situations detected where authorised SPRFMO vessels, with functioning VMS units onboard, began operating in SPRFMO without their VMS positional information displaying on Commission VMS (specific cases are identified in the VMS section of the Compliance report). While none of these incidents appear to be of nefarious intent it does highlight a potential weakness in the current vessel monitoring situation.

If a vessel is operating in SPRFMO with VMS activated and there is a disruption or cessation, there are several checks in place to detect this situation and to take action to restore the data feed within a short period of time. However, if a vessel enters SPRFMO without the VMS being sent or forwarded to Commission VMS it is very hard to detect these situations without a secondary vessel monitoring tool.

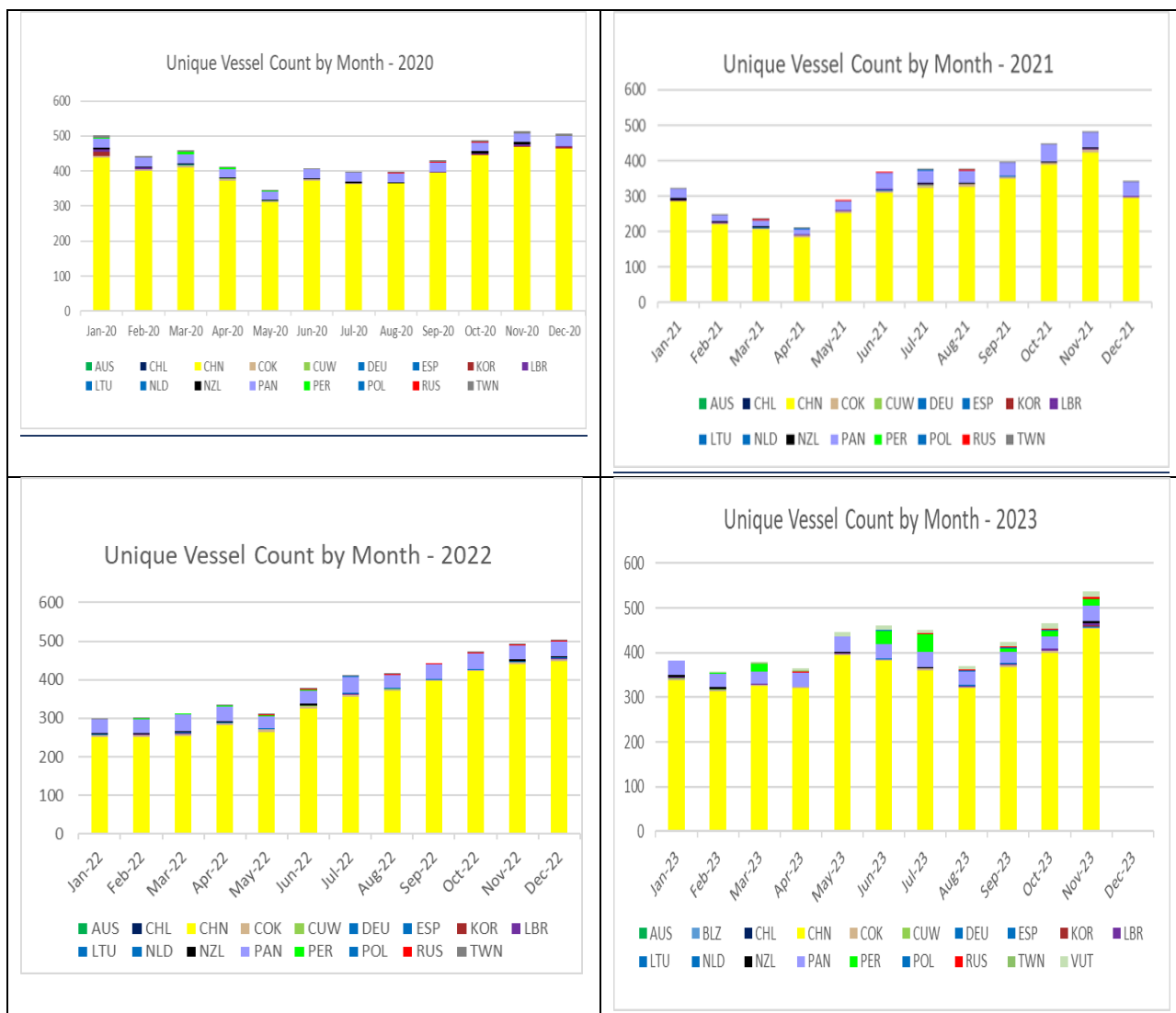
Often these situations come to light if the vessel later starts appearing on Commission VMS already in the Convention Area or is detected during ad hoc cross checks with other data sources such as Port Inspections, Transshipment, and/or Transfer (bunkering) related reports. Now that a new SPRFMO database is in place, it is suggested that work commence in 2024 to collate and store SPRFMO data holdings to improve and automate, the cross referencing of VMS against other SPRFMO data holdings to better identify any potential deficiencies in VMS reporting (or other data/compliance issues).

11. CTC Considerations

In summary, much has been done or is in progress, to improve the accuracy, efficiency, and functionality of the Commission VMS, particularly with respect to the day-to-day monitoring. Emphasis for 2024 and beyond will be to continue to enhance VMS data analysis and cross-referencing capabilities. This will require developing the means to automatically extract and update VMS positional data from THEMIS into the SPRFMO database and build the linkages to carry out, to the extent possible, automated reporting and analysis to support compliance with VMS and other CMMs. This component will need to be a part of a broader workplan for the enhancement of the new SPRFMO database.



ANNEX 1: Member/CNCP Unique Vessel Count by Month/Year⁴



⁴ Note: This ongoing monthly report is currently automatically produced by CLS from THEMIS on the first of each month for the previous month and is intended to display patterns of vessel movement in/out of SPRFMO throughout the year. It is based on the VMS positional data found in THEMIS for the stated month as of the monthly report production date. Occasionally, vessels not displaying on Commission VMS for an extended period will likely not be included in a particular monthly count even if “back data” was later updated to THEMIS (however they will be captured in subsequent monthly and annual reports if they remain in SPRFMO). VMS disruptions of a short duration are unlikely to significantly impact this report as it only requires a single position in SPRFMO to be recorded in THEMIS during the month to count.



ANNEX 2: VMS-UNIQUE VESSELS REPORT (01 Oct 2022 – 30 Sept 2023)

Australia	China	China	China
DIANA	FU YUAN YU 7882	FUYUANYU7637	HAN YI 899
PETUNA ENDEAVOUR	FU YUAN YU 7883	FUYUANYU7638	HANYI 22
Belize	FU YUAN YU 7884	FUYUANYU7669	HANYI17
AT HONOUR	FU YUAN YU 7885	FUYUANYU7670	HANYI23
Chile	FU YUAN YU 7886	FUYUANYU7671	HANYI27
PUERTO BALLENA	FU YUAN YU 7887	FUYUANYULENG36	HANYI78
China	FU YUAN YU YUN 995	FUYUANYUYUN65	HANYI838
CHANG SHUN 6	FU YUAN YU7611	FUYUANYUYUN877	HANYI839
CHANG SHUN 7	FU YUAN YU7612	FUYUANYUYUN878	HE BEI 8588
CHANG SHUN 8	FU YUAN YU7613	FUYUANYUYUN992	HE BEI 8589
CHANG SHUN 9	FU YUAN YU7614	FUYUANYUYUN997	HEBEI 8590
CHANG SHUN NO.1	FU YUAN YU7615	GANG TAI 1	HEBEI 8598
CHANG SHUN NO.2	FU YUAN YU7616	GANG TAI 8	HEBEI 8599
CHANG TAI 801	FU YUAN YU7617	GUOHONG5	HENG HONG 11
CHANG TAI 802	FU YUAN YU7618	GUOJI901	HENG HONG 9
CHANG TAI 806	FU YUAN YU7619	GUOJI902	HENGXIN1
CHANG TAI 807	FU YUAN YU7868	HAI DE LI 703	HENGXIN15
CHANG TAI 809	FU YUAN YU7869	HAI DE LI 708	HENGXIN16
CHANG TAI 810	FU YUAN YU7874	HAI FENG 1	HENGXIN68
CHANG TAI 811	FU YUAN YU7875	HAI FENG 3	HENGXIN7
CHANG TAI 812	FU YUAN YU7876	HAI FENG 4	HENGXIN78
DAPINGYUYUN99	FU YUAN YU7877	HAI FENG LONG 1	HONG DA 1
DONG YU 1529	FU YUAN YU7888	HAI FENG LONG 2	HONG DA 18
DONG ZHOU 21	FU YUAN YU7889	HAI FENG LONG 6	HONG DA 2
DONG ZHOU 22	FU YUAN YU7890	HAI LI 18	HONG PU 1
DONGZHOU17	FU YUAN YU7891	HAI LI 28	HONG PU 2
FENG CHENG 101	FU YUAN YU7892	HAI LI 38	HONG PU 37
FENG CHENG 103	FU YUAN YU7893	HAI LI 8	HONG PU 5
FENGHUI 9	FUYUANYU7620	HAI XING 1	HONG PU 57
FU XIN	FUYUANYU7621	HAI YANG 1	HONG PU 6
FU YUAN YU 7601	FUYUANYU7622	HAI YANG 5	HONG PU 88
FU YUAN YU 7602	FUYUANYU7624	HAI YANG 6	HONG RUN 1
FU YUAN YU 7603	FUYUANYU7625	HAI ZHI XING 801	HONG RUN 11
FU YUAN YU 7604	FUYUANYU7626	HAIDELI709	HONG RUN 16
FU YUAN YU 7605	FUYUANYU7627	HAIFENGLONG 5	HONG RUN 18
FU YUAN YU 7606	FUYUANYU7628	HAIFENGLONG9	HONG RUN 2
FU YUAN YU 7601	FUYUANYU7629	HAN YI 107	HONG RUN 3
FU YUAN YU 7602	FUYUANYU7630	HAN YI 21	HONG RUN 55
FU YUAN YU 7603	FUYUANYU7631	HAN YI 3	HONG RUN 57
FU YUAN YU 7604	FUYUANYU7632	HAN YI 6	HONG RUN 6
FU YUAN YU 7605	FUYUANYU7633	HAN YI 611	HONG RUN 668
FU YUAN YU 7606	FUYUANYU7634	HAN YI 7	HONG RUN 68
FU YUAN YU 7880	FUYUANYU7635	HAN YI 788	HONG RUN 75
FU YUAN YU 7881	FUYUANYU7636	HAN YI 8	HONGPU12



China	China	China	China
HONGPU16	JIA DE 16	JING YUAN 628	LU RONG YUAN YU YUN 678
HONGPU17	JIA DE 17	JINHAI857	LU RONG YUAN YU YUN 789
HONGPU3	JIA DE 18	JU LONG JIA YA 14	LU RONG YUAN YU YUN 999
HONGPU31	JIA DE 21	JU LONG JIA YA 17	LU WEI YUAN YU 858
HONGPU7	JIA DE 22	JU LONG JIA YA 22	LU WEI YUAN YU 868
HONGPU701	JIA DE 56	JU LONG JIA YA 28	LU WEI YUAN YU 898
HONGPU9	JIA DE 6	JU RONG YU 11	LU WEI YUAN YU 969
HONGRUN108	JIA DE 7	JU RONG YU 12	LU YAN YUAN YU 006
HONGRUN109	JIA DE 8	JULONGJIAYA12	LU YAN YUAN YU 007
HUA LI 16	JIAD 58	LIAO YU 8	LU YAN YUAN YU 008
HUA LI 17	JIAD68	LIAO YU 9	LU YAN YUAN YU 009
HUA LI 18	JIN HAI 616	LIAO YU ER HAO	LU YAN YUAN YU 011
HUA LI 19	JIN HAI 688	LIAO YU YI HAO	LU YAN YUAN YU 017
HUA LI 28	JIN HAI 701	LU LAN YUAN YU 689	LULANYUANYU058
HUA LI 8	JIN HAI 709	LU QING YUAN YU 161	LULANYUANYU059
HUA XIANG 801	JIN HAI 711	LU QING YUAN YU 162	LULANYUANYU068
HUA YING 1	JIN HAI 715	LU RONG YUAN YU 158	LULANYUANYU069
HUA YING 201	JIN HAI 716	LU RONG YUAN YU 195	LULANYUANYU088
HUA YING 205	JIN HAI 717	LU RONG YUAN YU 277	LUQINGYUANYU 275
HUA YING 208	JIN HAI 718	LU RONG YUAN YU 585	LUQINGYUANYU 276
HUA YING 209	JIN HAI 728	LU RONG YUAN YU 586	LUQINGYUANYU765
HUA YING 217	JIN HAI 758	LU RONG YUAN YU 602	LUQINGYUANYU766
HUA YING 261	JIN HAI 767	LU RONG YUAN YU 607	LUQINGYUANYU769
HUA YING 58	JIN HAI 771	LU RONG YUAN YU 608	LUQINGYUANYU770
HUA YING 78	JIN HAI 777	LU RONG YUAN YU 609	LURONGYUANYU186
HUA YING 803	JIN HAI 779	LU RONG YUAN YU 610	LURONGYUANYU187
HUA YING 809	JIN HAI 788	LU RONG YUAN YU 668	LURONGYUANYU197
HUA YING 811	JIN HAI 824	LU RONG YUAN YU 678	LURONGYUANYU538
HUA YING 813	JIN HAI 829	LU RONG YUAN YU 688	LURONGYUANYU539
HUA YING 815	JIN HAI 856	LU RONG YUAN YU 698	LURONGYUANYU581
HUA YING 817	JIN HAI 858	LU RONG YUAN YU 715	LURONGYUANYU582
HUA YING 818	JIN HAI 866	LU RONG YUAN YU 717	LURONGYUANYU701
HUA YING 819	JIN HAI 868	LU RONG YUAN YU 728	LURONGYUANYU702
HUA YING 87	JIN HAI 878	LU RONG YUAN YU 729	LURONGYUANYU708
HUA YING NO.207	JIN HAI 886	LU RONG YUAN YU 779	LURONGYUANYU709
HUAXIANG8	JIN HAI 888	LU RONG YUAN YU 808	LURONGYUANYU738
HUAYING218	JIN HAI YANG 1	LU RONG YUAN YU 809	LURONGYUANYU739
HUAYING821	JIN HAI YANG 2	LU RONG YUAN YU 881	LURONGYUANYU772
JIA DE 1	JIN ZHOU	LU RONG YUAN YU 882	LURONGYUANYU775
JIA DE 11	JING YUAN 601	LU RONG YUAN YU 885	LURONGYUANYU831
JIA DE 12	JING YUAN 608	LU RONG YUAN YU 887	LURONGYUANYU832
JIA DE 15	JING YUAN 626	LU RONG YUAN YU 939	LURONGYUANYU833



China	China	China	China
LURONGYUANYU835	NING TAI 21	NINGTAI 15	PU YUAN 835
LURONGYUANYU838	NING TAI 22	NINGTAI51	PU YUAN 837
LURONGYUANYU839	NING TAI 26	NINGTAI601	PU YUAN 838
LURONGYUANYUYUN177	NING TAI 27	NINGTAI615	PU YUAN 855
LURONGYUANYUYUN898	NING TAI 28	NINGTAI717	PU YUAN 856
LUWEIYUANYU 018	NING TAI 3	NINGTAI72	PU YUAN 868
LUWEIYUANYUYUN 777	NING TAI 35	NINGTAI815	PU YUAN 877
MING HUA	NING TAI 37	NINGTAI88	PU YUAN 878
MING WANG	NING TAI 38	OU YA 17	PU YUAN 885
MING XIANG 801	NING TAI 5	OU YA 18	PU YUAN 887
MING XIANG 802	NING TAI 52	OU YA 7	PU YUAN 898
MING XIANG 803	NING TAI 55	OU YA 8	PUYUAN886
MING XIANG 807	NING TAI 56	OU YA 9	RONG YUAN YU 168
MING XIANG 809	NING TAI 57	PINGTAIRONGLENG1	RONG YUAN YU 169
MING XIANG 816	NING TAI 58	PINGTAIRONGLENG6	RONG ZHOU
MING XIANG 817	NING TAI 6	PU YUAN 707	RUN DA 601
MING XIANG 818	NING TAI 61	PU YUAN 711	RUN DA 602
MING XIANG 819	NING TAI 616	PU YUAN 713	RUN DA 605
MING XIANG 857	NING TAI 617	PU YUAN 715	RUN DA 607
MING XIANG 868	NING TAI 62	PU YUAN 716	RUN DA 610
MING XING	NING TAI 65	PU YUAN 718	RUN DA 617
MING YUAN	NING TAI 66	PU YUAN 719	RUN DA 618
MING ZHOU 622	NING TAI 69	PU YUAN 720	RUN DA 677
MING ZHOU 8	NING TAI 7	PU YUAN 721	RUN DA 806
MING ZHOU 839	NING TAI 71	PU YUAN 755	RUN DA 9
MINGXIANG805	NING TAI 75	PU YUAN 768	RUNDA 18
MINGXIANG808	NING TAI 76	PU YUAN 775	RUNDA 25
MINGXIANG811	NING TAI 77	PU YUAN 777	RUNDA 603
MINGXIANG821	NING TAI 78	PU YUAN 802	RUNDA 613
MINGXIANG826	NING TAI 8	PU YUAN 803	RUNDA 18
MINGXIANG828	NING TAI 81	PU YUAN 805	RUNDA 216
MINGXIANG858	NING TAI 83	PU YUAN 806	RUNDA 25
MINGXIANG878	NING TAI 85	PU YUAN 807	RUNDA 603
MINGXIANG889	NING TAI 86	PU YUAN 808	RUNDA 613
NING TAI 1	NING TAI 87	PU YUAN 811	SHEN GANG SHUN 6
NING TAI 11	NING TAI 89	PU YUAN 816	SHEN GANG SHUN 8
NING TAI 12	NING TAI 9	PU YUAN 817	SHUN XING 16
NING TAI 16	NING TAI 97	PU YUAN 818	SHUN XING 17
NING TAI 17	NING TAI LENG 5	PU YUAN 819	SHUN XING 18
NING TAI 18	NING TAI LENG 6	PU YUAN 820	SHUN ZHOU 811
NING TAI 19	NING TAI LENG 7	PU YUAN 826	SHUN ZHOU 815
NING TAI 2	NING TAI LENG 8	PU YUAN 827	SHUN ZHOU 817



China	China	China	Panama
SHUNHANG68	XIN JI LI 56	ZHOU YU ER HAO	ANDALUCIA CARRIER
SHUNHANG86	XING WANG 111	ZHOU YU YI HAO	ANGARA
SHUNZE 958	XING WANG 222	ZHOU YU YI HAO	ANGEL 101
SHUNZE 958	XING WANG 333	ZHOUHONG YUAN 16	ANGEL 106
SHUNZE58	XING WANG 99	ZHOUHONG YUAN 7	ANGEL 118
SHUNZE6	XINHAILENG1	ZHOUPU818	ANGEL 22
SHUNZE677	XINHAILENG2	ZHOUYU917	ANGEL 38
SHUNZE68	YI FENG RUN 6	ZHOUYU918	ANGEL NO.1
SHUNZE689	YING HAI 798	ZHOUYU919	ANGEL NO.2
SHUNZE728	YONG FA YUN 10	ZHOUYU920	AT GLORY
SHUNZE729	YONG FA YUN 12	ZHOUYU921	AT LUCKY
SHUNZE75	YUAN SHENG 6	ZHOUYU922	BAO LUCKY
SHUNZE77	YUANJIA1	ZHOUYU925	BAO WIN
SHUNZE777	ZHANHAI005	ZHOUYU926	BOYANG CAPELLA
SHUNZE801	ZHANHAI006	ZHOUYU927	CONCORD EXPRESS
SHUNZE805	ZHANHAI007	ZHOUYU928	CONCORD SERENITY
SHUNZE806	ZHE PU YUAN 37	ZHOUYU929	DON REEFER
SHUNZE807	ZHE PU YUAN 58	ZHOUYU930	FENG YU
SHUNZE811	ZHE PU YUAN 67	Cook Islands	FRIO MARATHON
SHUNZE83	ZHE PU YUAN 68	AKANUI	FRIO OCEANIC
SHUNZE836	ZHE PU YUAN 77	B PACIFIC	FRIO STAR
SHUNZE85	ZHE PU YUAN 98	CHANG SHENG 36	FULL KUO SHIN
SHUNZE86	ZHEN FA 5	HAI SOON 61	GENTA MARU
SHUNZE87	ZHEN FA 7	PROGRESS 10	GRANADA CARRIER
SHUNZE881	ZHEPUYUANLENG7	Curacao	HAI FENG 618
SHUNZE882	ZHONG JU 18	PRINCE OF SEAS	HAI FENG 678
SHUNZE9	ZHONG YUAN YU 16	European Union	HAI FENG 718
SHUNZE98	ZHONG YUAN YU 17	ALINA	HAI GONG YOU 303
SHUNZELENGYUN5	ZHONGJU1	ANNELIES ILENA	HAI GONG YOU 306
SU YUAN YU 6	ZHONGJU7	COOL EXPRESO	HAI GONG YOU 309
SU YUAN YU 9	ZHONGJU88	MAARTJE THEADORA	HAI JI LI
TAO YUAN 605	ZHOU HONG YUAN 1	MARGIRIS	HARIMA
TAO YUAN 607	ZHOU HONG YUAN 2	SIMONAS DAUKANTAS	HARU
TIAN SHUN	ZHOU HONG YUAN 9	TRONIO	HARVEST 62
TIAN XIANG	ZHOU PU 27	Liberia	HE TAI
TIAN YUE 1	ZHOU PU 5	ACONCAGUA BAY	KAI DE
TIAN YUE 2	ZHOU PU 668	HAI GONG YOU 309	KHANA
WAN XIN 7	ZHOU PU 806	HAI XING	LADY TUNA
WAN XIN 76	ZHOU PU 98	HE SHUN	LIAOYOU REEFER 1
WANXIN32	ZHOU YU 7	WEI NING	LIAOYU REEFER 1
WANXIN38	ZHOU YU 8	New Zealand	MABAH
WANXIN87	ZHOU YU 901	AMALTAL ENTERPRISE	MING HANG 5
WEI YU 16	ZHOU YU 902	JANAS	MING HANG 7
WEI YU 18	ZHOU YU 905	MANAKAI	MIRACLE
WEI YU 19	ZHOU YU 906	SAN AOTEA II	MYLO
XIN JI LI 15	ZHOU YU 907	SAN ASPIRING	NESTOS REEFER
XIN JI LI 16	ZHOU YU 908	SANTA MARIA	NEW HARMONY
XIN JI LI 5	ZHOU YU 915	SARDA	NEW SMILE
XIN JI LI 55	ZHOU YU 916	TANGAROA	NEW TAKATSUKI



Panama	Peru	Peru	Vanuatu
NO. 2 POHAH	ALESSANDRO	RIBAR XVIII	ANGEL 101
OCEAN CRYSTAL	BAMAR II	RODAS	ANGEL 106
OCEAN SPLENDID	BAMAR IV	SAN MARTIN	ANGEL 22
OCEAN STAR 86	BAMAR VIII	SAN MARTIN 3	HAI FENG 658
PROCYON	CARACOL	SAN MARTIN NRO. 6	HAI FENG 668
PROSPERITY 12	CARMENCITA	SEBASTIAN	HAI FENG 678
QI HANG	COSTA DEL SOL	SEBASTIAN 1	HAI FENG 688
RUI SHENG	CRETA	SIEMPRE FORTUNA	HAI FENG 718
RYOMA	DANIELLA	SIMON	HAI FENG 728
SEA PEARL I	DON ALFREDO	STEFANO	MING HANG 5
SEA REEFER	DON JUAN	TASA 41	QI HANG
SEA STAR V	DON OLE	TASA 42	RONG JIN ZHI LU
SEA TRADER I	ESTRELLA DE DAVID 10	TASA 51	SHEN JU
SHEN JU	ESTRELLA DE DAVID 5	TASA 52	YONG XIANG 9
SHIN HO CHUN NO. 101	ETEN DIEZ	TASA 53	END OF LIST
SHIN HO CHUN NO. 102	GRACIELA	TASA 54	
SHUN ZE LENG 6	GUIAME DIVINO CAUTIVO	TASA 55	
SHUN ZE LENG 7	HUACHO CINCO	TASA 56	
TAGANROGSKIY ZALIV	INCAMAR 1	TASA 57	
TIARA 108	INCAMAR 2	TASA 59	
TRITON REEFER	ISABELITA	TASA 71	
TUNA PRINCESA	JESUCRISTO EL GALILEO	VEA	
TUNA PRINCESS	KIANA	Russian Federation	
ULTRA ENERGY	KIARA B	ADMIRAL SHABALIN	
VIVA 106	LIGRUNN	KOMANDOR	
WATER PHOENIX	MARIA JOSE	VASILIIY POLESHCHUK	
YONG XIANG 9	PATRICIA	Chinese Taipei	
ZHONG XIE 8	PITI	SHENG HONG	
ZHONG YU MARINE	POLAR IV	SHUN TIAN FA NO.168	