



## **TECHNICAL AND COMPLIANCE COMMITTEE**

### **Eleventh Regular Session**

23 – 29 September 2015

Pohnpei, Federated States of Micronesia

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## **ANNUAL REPORT FOR THE COMMISSION VMS**

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**WCPFC-TCC11-2015-RP01**

**7 September 2015**

### **Paper prepared by Secretariat**

#### **Purpose**

1. This paper presents for the consideration of TCC11 the annual report for the Commission vessel monitoring system prepared in accordance with CMM 2011-02 and VMS SSPs requirements paragraphs 7.3.9 and 7.3.10.

#### **Background**

2. Article 24(8) of the Convention obliges each Member of the Commission to require its fishing vessels that fish for highly migratory stocks on the high seas of the Convention Area to use an ALC/MTU which meets agreed WCPFC Standards, Specifications and Procedures, while in these areas. To implement this requirement, the Commission has adopted CMM 2014-02 Commission Vessel Monitoring System Conservation and Management Measure (which replaced CMM 2011-02), a set of Standards, Specifications and Procedures (SSPs) which were approved in 2008 (WCPFC5) and a set of Standard Operating Procedures (SOPs) which were approved in 2009 (WCPFC6).

3. In addition, some CCMs have opted to have their waters under their national jurisdiction covered by the WCPFC VMS. Tonga and Nauru are the latest CCMs that have opted to have the waters under their national jurisdiction covered by the WCPFC VMS.

4. Paragraph 7.3.3 of the SSPs requires, in part, that the Secretariat develop and manage a service level agreement (SLA) with the FFA for provision of VMS services. This SLA was signed by the Secretariats of the WCPFC and FFA in early December 2008, and the WCPFC VMS became operational in April 2009. Since then the WCPFC Secretariat has regularly met with the FFA Secretariat to monitor the delivery of SLA services in support of Commission VMS implementation. During 2014 the WCPFC and FFA Secretariats met in March, June and September/October to discuss FFA/WCPFC VMS matters. The next SLA meeting is scheduled in the margins of TCC11, at WCPFC Headquarters in Pohnpei.

5. WCPFC9 adopted a Statement of Purpose and Principles for the WCPFC VMS. The stated purpose of the WCPFC VMS is “to cost-effectively monitor the activities of fishing vessels authorized by flag States to fish for highly migratory fish species in the Convention Area in areas beyond jurisdiction of the Flag State. Data collected by the Commission VMS will be securely stored and used by the Commission and its Members, Cooperating Non-Members, and Participating Territories (CCMs) to achieve compliance with Conservation and

Management Measures (CMMs), fisheries scientific analysis and sound fisheries management decision-making in the Convention Area.”

### Commission VMS Database

6. Paragraph 2.8 of the SSPs requires the Secretariat to administer a Commission VMS database. Currently this database is administered and hosted in Sydney under the WCPFC-FFA SLA for the WCPFC VMS services. There is currently no formal link within the WCPFC VMS between the data in the WCPFC Record of Fishing Vessels (RFV), which is hosted at Headquarters in Pohnpei, and the Commission VMS database hosted in Sydney.

7. Some general statistics on the WCPFC VMS over time are provided in the following tables and charts.

Figure1. Vessel activations by year

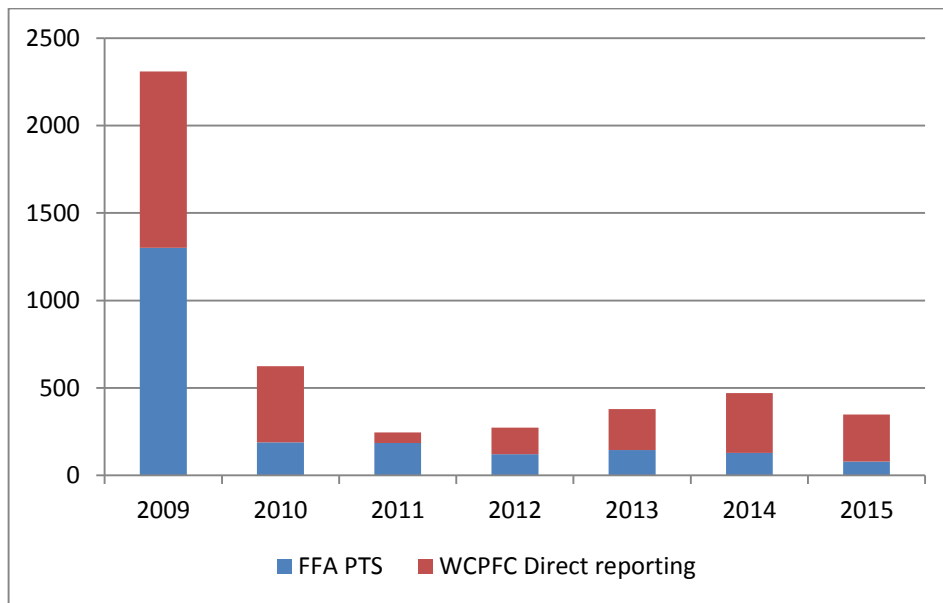


Figure 2. Number of VMS vessels against RFV List

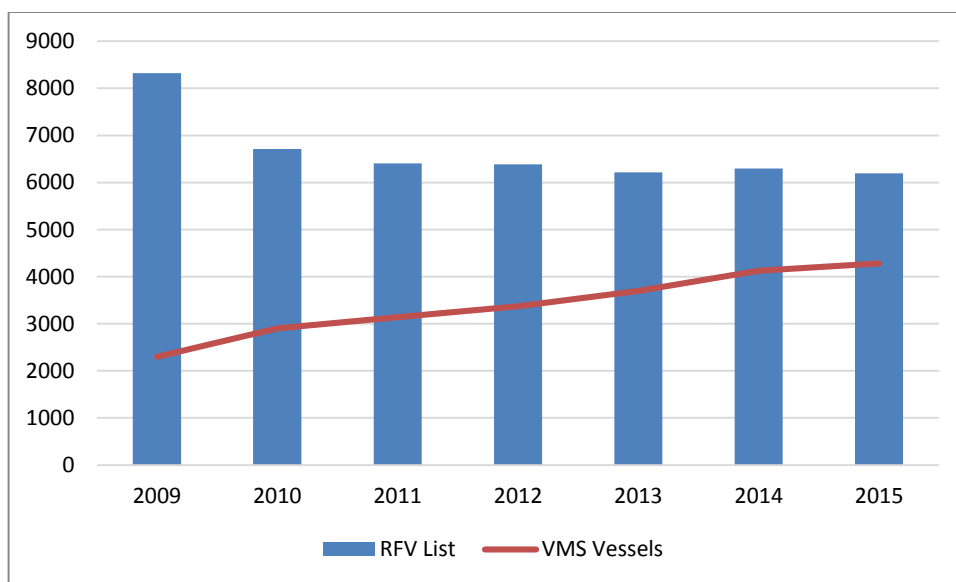
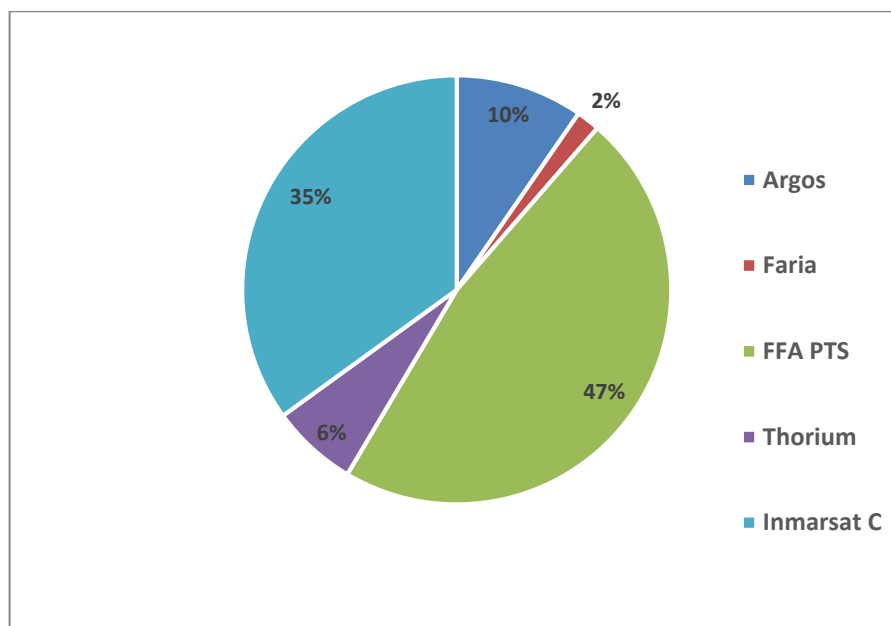


Table 1. Number of vessels that were detected on WCPFC VMS during each year 2009 – 22 August 2015.

Year	Number of Vessels Reporting to WCPFC VMS <sup>1</sup>
2009	2,158
2010	2,535
2011	2,471
2012	2,779
2013	2,970
2014	3,591
2015	3,014

Figure 3. Number of vessels reporting by channel on the WCPFC VMS in August 2015



8. The details on the Vessel Tracking Agreement Form (VTAF) are needed to allow the Secretariat to electronically monitor the ALC/MTU unit and to disseminate data from it in accordance with WCPFC policy. VTAF form can be downloaded from the Commission website - <http://www.wcpfc.int/vessel-monitoring-system>. In accordance with the Commission VMS SOPs, all vessels operating in the Convention Area that are required to report to the Commission VMS are to provide details outlined in the Vessel Tracking Agreement Form (VTAF).<sup>2</sup> However it should be noted that the Commission has clarified that vessels which can be confirmed to be in good standing on the FFA Vessel Register shall be exempted from the requirements to submit the information contained in a VTAF for the Commission’s VMS.<sup>3</sup> In 2014, the WCPFC Secretariat commenced some work with the assistance of the FFA Secretariat to develop a mechanism which will allow the WCPFC Secretariat to be able to duly take into account the status of particular vessels on the FFA Vessel Register over time – this work continues.

<sup>1</sup> Figures from previous reports included duplicate vessel reporting.

<sup>2</sup> As clarified at TCC9, CCMS can either submit the VTAF form, or submit a file that contains the VTAF form for their vessels.

<sup>3</sup> TCC 9 report paragraph 137: TCC9 agreed to recommend to WCPFC10 that vessels which can be confirmed to be in good standing on the FFA Vessel Register shall be exempted from the requirements to submit the information contained in a VTAF for the Commission’s VMS. (WCPFC10 adopted this recommendation, see paragraph 220 of WCPFC10 report)

9. One aspect that appears to the Secretariat to perhaps warrant some further consideration at TCC11 are arrangements that would provide some improved checks to identify and support the VMS reporting by vessels when they change between the WCPFC VMS and FFA VMS systems. In recent times there have been a number of instances where, through WCPFC members High Seas Boarding and Inspections, Port Inspections or MCS operations, vessels have been identified as possibly not meeting WCPFC VMS requirements, but further investigations have found that there were some procedural issues which delayed activating the VTAF (Vessel Tracking Activation Form) details. Often the vessel that previously was reporting through the FFA VMS was not properly activated to report directly to the WCPFC VMS. Refer to recommendation in paper WCPFC-TCC11-2015-15.

10. Annex 1 provides a summary of the number of vessels by CCM for which the Secretariat has VTAFs details on file (as at 22 August 2015). Also listed in **Annex 1**, for comparative purposes, are the number of vessels by flag on the WCPFC RFV.

11. The “mapping table” which provides a link between vessels data in the RFV and the vessels data in the Commission VMS database was completed in the first quarter of 2015. This is an important part of the Secretariats integrated MCS information management system development. With the completion of this task the Secretariat now has the capability to utilize WCPFC VMS data in its routine monitoring of CMMs, for example monitoring reporting in special management areas (EHSP-SMA and HSP1), and monitoring high seas transshipment monitoring (CMM 2009-06). Being able to link the WCPFC VMS data to the WCPFC RFV, also strengthen the Secretariats ability to monitor and check the regular reporting of vessels on the WCPFC VMS, which has provided improvements in the administering of the VMS Manual Reporting procedures. All WCPFC Secretariat work involving WCPFC VMS data will be in accordance with the WCPFC decisions, CMMs and data access rules and procedures, and the WCPFC Information Security Policies.

12. In August this year the Inmarsat Land Earth Station (LES) in Yamaguchi, Japan was rendered inoperable and VMS position reports were lost during the period of the outage. It is estimated that approximately 91,000 VMS position reports from 1,563 vessels were lost.

#### **Operationalizing Article 24(8) of the Convention – (*Flick the Switch*)**

13. Since the “*Flick the Switch*” proposal was approved at WCPFC9 the following CCMs - Australia, Federated States of Micronesia, France (including New Caledonia, French Polynesia and Wallis and Futuna), Palau, Tuvalu, the United States and Samoa provided letters of notification for the WCPFC VMS to cover their EEZ during 2013. There were no additional notifications in 2014. Tonga (March) and Nauru (July) are the 2 additional CCMs to “*Flick the Switch*” in 2015. For the complete list see Table 2. Map showing “*Flick the Switch*” zone is appended in Annex 2.

14. A summary of the number of VMS position data received by the Commission VMS (both from vessels reporting directly to the WCPFC VMS and through the FFA VMS), is shown in Table 3.

**Table 2. List of WCPFC Members whose waters are included in the Commission VMS, which is maintained by the Secretariat in accordance with the WCPFC9 decision (\* = these three Members had their national waters included in the Commission VMS in accordance with previous WCPFC decisions)**

<u>CCM</u>	<u>Activation Date</u>
New Zealand*	23 Feb 2010 (Tokelau was activated on 22 <sup>nd</sup> Aug 2012)
Cook Islands*	14 <sup>th</sup> May 2010
Niue*	1 <sup>st</sup> Jan 2013
United States of America	9 <sup>th</sup> March 2013
Australia	15 <sup>th</sup> March 2013
Federated States of Micronesia	4 <sup>th</sup> April 2013
France (include NC,PF & WF)	NC – 13 <sup>th</sup> June 2013 PF & WF – 19 <sup>th</sup> June 2013
Palau	1 <sup>st</sup> September 2013
Tuvalu	8 <sup>th</sup> September 2013
Samoa	6 <sup>th</sup> October 2013
Tonga	13 <sup>th</sup> March 2015
Nauru	17 <sup>th</sup> July 2015

**Table 3. Number of position reports by area monitored by WCPFC VMS.<sup>4</sup>**

AREA NAME	2009	2010	2011	2012	2013	2014	2015
Australia (EEZ)					20,482 <sup>1</sup>	41,140	66,136
Cook Islands (EEZ)		2,677 <sup>1</sup>	4,541 <sup>1</sup>	9,053 <sup>1</sup>	34,353 <sup>1</sup>	133,134	63,491
Federated States of Micronesia (EEZ)					128,892 <sup>1</sup>	475,392	352,506
France - NC, PF & WF (EEZs)					33,174 <sup>1</sup>	64,308	32,938
New Zealand & Tokelau (EEZs)		7,916 <sup>1</sup>	16,122 <sup>1</sup>	17,506 <sup>1</sup>	35,691 <sup>1</sup>	100,527	124,223
Nauru							9,113
Niue (EEZ)					4,343 <sup>1</sup>	8,833	5,901
Republic of Palau (EEZ)					89,486	300,647	213,630
Samoa (EEZ)					7,106	29,109	15,212
Tonga							11,960
Tuvalu (EEZ)					33,647	129,668	90,871
United States of America (EEZs)					343,325 <sup>1</sup>	351,624	290,526
High Seas in WCPFC Convention Area	1,172,244	1,502,480	1,537,517	1,918,010	2,066,230	2,338,732	1,853,038
TOTAL	1,172,244	1,513,073	1,558,180	1,944,569	2,796,729	3,973,114	3,129,545
Quarantined data	713,978	1,581,635	1,684,642	2,145,095	2,168,678	2,505,956	1,644,433

<sup>4</sup> Note as was advised in TCC10-2014-RP01\_rev1 while the WCPFC direct reporting vessels positions were viewable from the “activation date, there were there were some technical constraints and the FFA position transfer for EEZ areas covered by the WCPFC VMS did not commence until 5th September 2013. The WCPFC Secretariat and FFA Secretariat have ongoing work to find the best mechanism to include the back-log of FFA position transfer data for “flick-the-switch” into the WCPFC VMS databases.

## **Provision of High Seas Data for MCS Activities**

15. 2009 WCPFC Rules and Procedures for the Protection, Access to and Dissemination of High Seas Non-Public Domain Data and Information allows for CCMs conducting MCS activities, including in areas under national jurisdiction to request and receive, WCPFC VMS data, from high seas areas adjacent to up to 100 nautical miles adjacent to, and outside their Exclusive Economic Zones (paragraph 22 and 23). Seventeen CCMs have requested access to 100nm high seas buffer, some on an ongoing basis, and others for the purposes of specific MCS activities: Australia, Cook Islands, Federated States of Micronesia, French Polynesia, Japan, Kiribati, Republic of Marshall Islands, Nauru, New Zealand, Niue, Palau, Philippines, Solomon Islands, Tokelau, Tonga, Tuvalu and United States of America. In accordance with CMM 2010-02, access to the EHSP-SMA WCPFC VMS data has been provided to the adjacent CCMs: Cook Islands, French Polynesia and Kiribati. Some FFA members have nominated the FFA Regional Fisheries Surveillance Centre in Honiara, Solomon Islands, as one of their MCS personnel to receive WCPFC VMS data on their behalf.

16. In accordance with the WCPFC9 decision to “*flick the switch*” the WCPFC has provided CCMs with the option of receiving a regular feed of WCPFC VMS data, as an additional service to the SmartTrac WCPFC VMS client login. All WCPFC VMS data requests have been implemented using both automatic push and SmartTrac login activation.

17. In accordance with 2009 Data Access Rules and Procedures, a number of members also have requested and received high seas WCPFC VMS data for high seas MCS activities where the member has a MCS presence or capability on the high seas (paragraph 21).

## **Log of Manual Reports**

18. WCPFC11 Regular Session accepted the recommendation from TCC10 and extended the VMS manual position reporting requirements (the WCPFC9 agreed amendments to the VMS SSPs Section 5) until 1 March 2017.

19. The Secretariat maintains a log of all vessels placed on manual reporting as required by the SSPs on VMS. The manual reports are also entered in the Commission VMS database. It should be noted that some vessels have delayed in reporting manually until urged by their flag State. Manual reports received by the Secretariat includes Philippines support vessels (light boats) which do not have MTUs installed.

20. The Secretariat does acknowledge there remain some challenges to the implementation of the VMS SSPs for manual reporting provisions. One of these challenges is that the first step, which occurs before a vessel may be asked to manually report its position to WCPFC: the Secretariat must be able to ascertain that there has been non-reception of two consecutive, programmed high seas VMS positions. Another is that the Secretariat has not yet been able to meet the requirements of VMS\_SSPs 5.6 “The Secretariat shall maintain and make available to all CCMs a current list of those vessels subject to manual reporting and the duration of that reporting”. This remains an outstanding and priority task for the Secretariat.

21. During the outage of the Yamaguchi LES, the Secretariat requested vessels to provide manual reports as there were no other avenues to receive VMS position reports. Some CCMs raised the issue of manual reporting requirement stating that the MTUs on the vessels were functioning and were reporting to the national VMS therefore should not be required to report their positions manually.

**Table 4. Number of vessels by flag that provided manual reports**

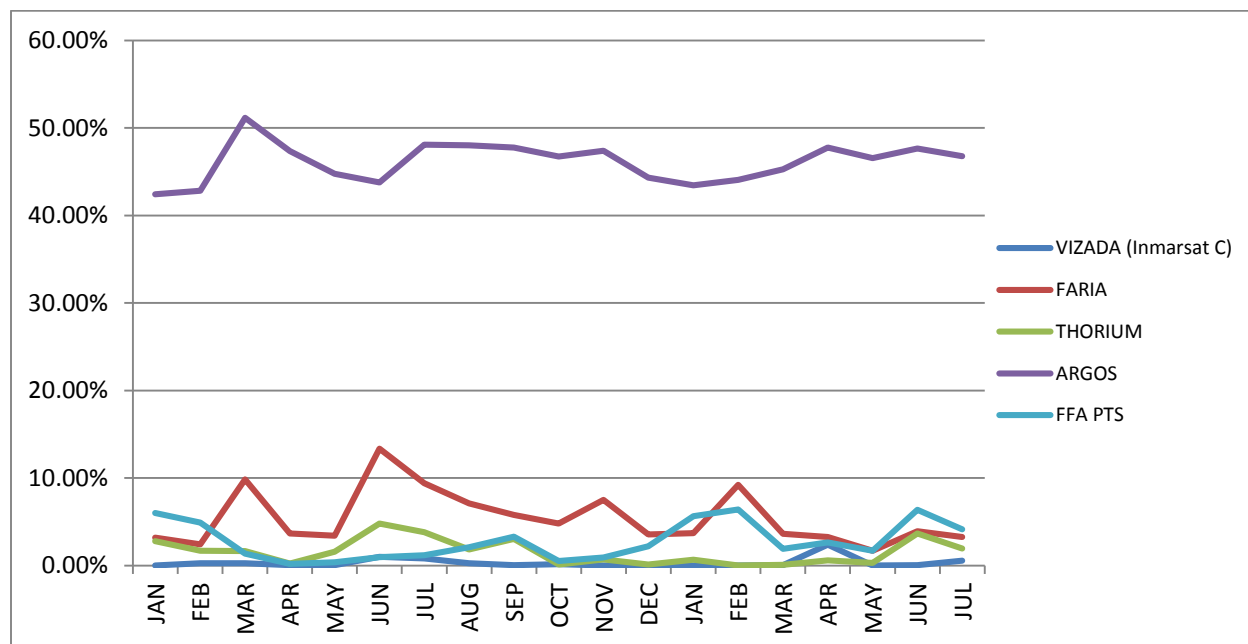
Flag	2013	2014	2015
China	34	24	11
Chinese Taipei	15	2	8
Cook Islands	3	1	1
Ecuador	1		1
Federated States of Micronesia	2	6	5
Fiji	7		
Japan	4	11	19
Kiribati	5		1
Korea (Republic of)	7	2	1
Marshall Islands			1
New Zealand			4
Panama	2	3	
Philippines	32	75	86
Spain	8	4	
United States of America	9	2	6
Vanuatu	3	1	14
Vietnam	1		
<b>Total</b>	<b>133</b>	<b>131</b>	<b>158</b>

**List of Non-Compliant ALCs**

22. In response to the requirement in paragraph 7.3.10 of the WCPFC VMS SSPs, the WCPFC Secretariat has no progress to report on developments of new gateways for DMR , BB5 and ROMTRAX MTUs . 41 vessels from 2 CCMs have these units installed. As advised previously, it is expected that CCMs whose vessels are using MTUs for which WCPFC VMS has not established a gateway, will be required to pay for the cost of developing new gateways to cater for these units.

23. CMM 2014-02 Annex 1 paragraph 4 requires VMS data reports be received by the Commission within 90 minutes of being generated by the ALC / MTU under normal conditions. Figure 3 below shows by percentage position received more than 90 minutes after being sent from the MTU.

**Figure 3. Percentage of overdue position reports by months from January 2014 to July 2015 for “Normal” positions only.**



## ALCs Comply with WCPFC Standards

24. Paragraphs 2.9 and 2.13 of the SSPs state that CCMs are to carry out a periodic audit of a representative sample of installed ALCs. The results of these audits are to be provided to the Commission by CCMs in the Part 2 Annual Report to the Commission (WCPFC VMS SSPs 7.2.2). Since 2013, the WCPFC Secretariat has provided CCMs with an electronic facility to report their MTU audit inspection results.

**Table 5. Number of MTU audits by type from 2013 to date.**

MTU Manufacturer	Model Types	2013	2014	2015
Anritsu	1	8	5	1
CLS ARGOS	4	119	148	65
Faria - Watchdog	2	214	176	1
Furuno	3	142	271	22
JRC	2	15	37	5
Sailor	2	31	4	0
Thrane & Thrane	10	197	256	13
Trimble	1	3	1	0
	<b>25</b>	<b>729</b>	<b>898</b>	<b>107</b>

**Table 6. Number of MTU audits by flag state from 2013 to date**

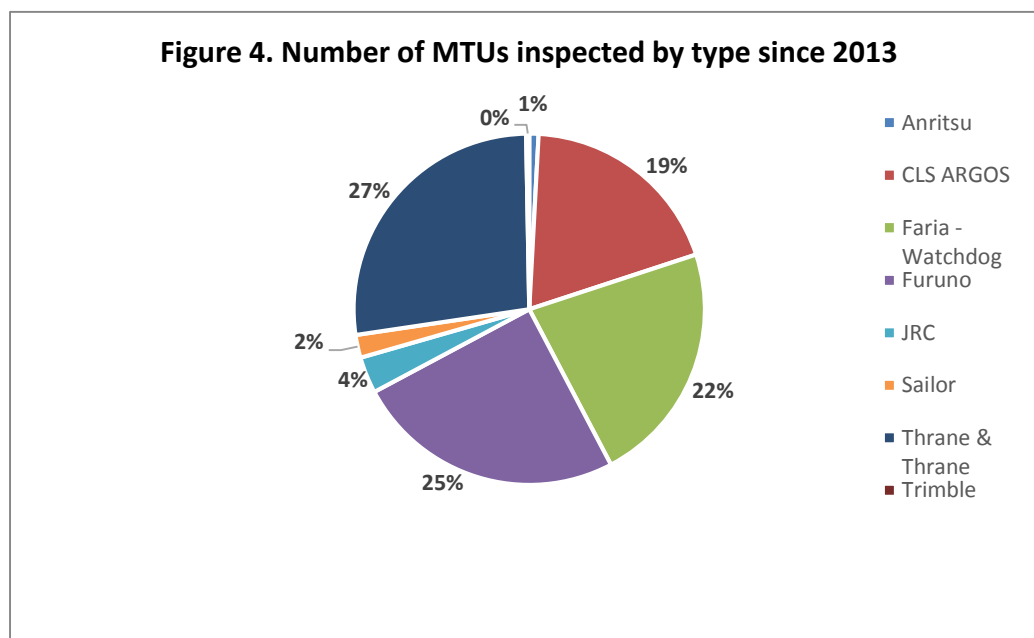
Flag	2013	2014	2015
Australia	9		
Canada	1	2	
China	187	216	19
Cook Islands	12	9	1
Ecuador	7		
El Salvador	4	4	
EU - France			
EU - Lithuania			
EU - Malta	1		
EU - Netherlands			
EU - Portugal			
EU - Spain	5	5	
Federated States of Micronesia	25	24	1
Fiji	54	67	
French Polynesia			
Indonesia			
Japan	19	106	21
Kiribati	4	26	1
Korea (Republic of)	88	115	
Liberia	1		
Marshall Islands	14	13	
New Caledonia		18	
New Zealand	1	4	
Panama		11	
Papua New Guinea	16		
Philippines	93	118	



Russian Federation			
Solomon Islands			
Chinese Taipei	14	5	
Thailand			
Tonga			
Tuvalu			
United States of America	121	154	64
Vanuatu	53	1	
<b>Total</b>	<b>729</b>	<b>898</b>	<b>107</b>

25. The results of the audits are compiled by the Secretariat into a VMS Audit Report Document. The list of countries and the number of MTU inspections by vessel type is appended in Annex 3. MTU/ALC type approval list as provided by CCMs are listed in Annex 4.

Figure 4 shows the proportion of MTU types which were inspected since 2013.



### VMS is Stable, Reliable and Fully Maintained

26. SSP 7.3.2 requires the WCPFC Secretariat to provide a stable, reliable, fully maintained and supported Commission VMS that conforms to the security standards set out in the Commission's ISP. The Commission VMS is housed at the FFA's Pacific VMS infrastructure at Macquarie Telecom Data Center and fully managed by FFA Secretariat and its VMS Service provider. The redundant system for backup/data security purposes is located at the Secretariat in Kolonia, Pohnpei. All planned work by the WCPFC Secretariat through the WCPFC IMS system using WCPFC VMS data, will be done in accordance with the applicable rules for access and protection of WCPFC VMS data by the WCPFC Secretariat and the Commissions ISP.

### Recommendation

27. TCC11 is invited to consider and comment on the annual report on the Commission VMS.

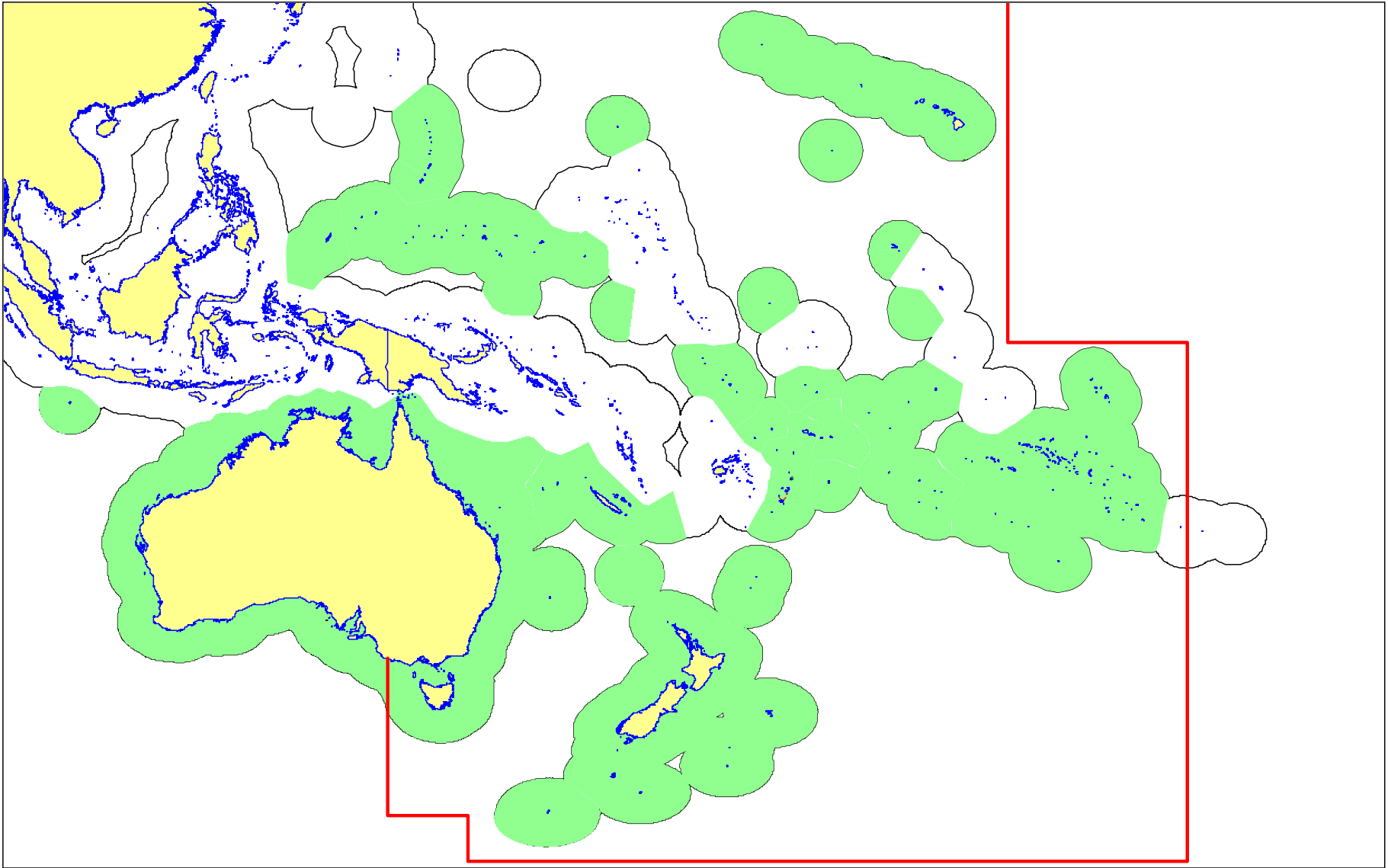
Number of vessels on RFV and reporting to WCPFC VMS<sup>5</sup>

Flag	WCPFC RFV	VTAFs Received	Reported on VMS 2015
Australia	64	59	59
Canada	21	7	6
China	670	379	468
Cook Islands	14	11	16
Ecuador	11	8	10
El Salvador	4	3	2
EU - France	14		
EU - Lithuania	4		1
EU - Netherlands	4	1	1
EU - Portugal	9	1	1
EU - Spain	51	17	23
Federated States of Micronesia	32	21	27
Fiji	75	14	48
French Polynesia	83		
Indonesia	394	78	44
Japan	862	564	714
Kiribati	40	26	47
Korea (Republic of)	298	167	155
Liberia	9	1	1
Marshall Islands	16	8	18
New Caledonia	17	12	21
New Zealand	7	6	8
Panama	84	26	66
Papua New Guinea	62	20	34
Philippines	812	126	156
Russian Federation	1		1
Solomon Islands	5		1
Chinese Taipei	1,678	886	721
Thailand	8	2	2
Tonga	1		
Tuvalu	6	5	5
United States of America	213	167	222
Vanuatu	133	115	124
<b>Total</b>	<b>5,702</b>	<b>2,730</b>	<b>3,002</b>

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<sup>5</sup> Data as of 22 August 2015

Map showing “Flick the Switch” zones.



## List of flag states, vessel type and number of MTU inspections. As at 22 August 2015

Flag	Vessel Type	Active on RFV	2011	2012	2013	2014	2015
Australia	Longliner	35			6		
Australia	Tuna longliner	7			3		
Canada	Multipurpose vessel nei	10			1		
China	FISH CARRIER	8			1	1	
China	Longliner	297			88	135	12
China	Purse seiner	69			2	5	
China	Tuna longliner	267			91	64	7
China	Tuna purse seiner	11			4	8	
Cook Islands	Longliner	2			1	2	
Cook Islands	Tuna longliner	9			7	7	1
Ecuador	Tuna purse seiner	7			1	2	
El Salvador	Tuna purse seiner	4			7	7	1
Federated States of Micronesia	BUNKER	1			1	1	
Federated States of Micronesia	FISH CARRIER	1			1		
Federated States of Micronesia	Longliner	3			2	3	
Federated States of Micronesia	Purse seiner	8			5	6	
Federated States of Micronesia	Tuna longliner	15			12	14	1
Federated States of Micronesia	Tuna purse seiner	4			4		
Fiji	Longliner	24			15	19	
Fiji	Tuna longliner	51			33	45	
Japan	MULTIPURPOSE VESSEL	1				1	
Japan	Pole and line	83			2	13	7
Japan	Tuna longliner	520			7	69	12
Japan	Tuna purse seiner	39			6	22	
Kiribati	BUNKER	11				3	
Kiribati	FISH CARRIER	15			1	9	
Kiribati	Purse seiner	1				1	
Kiribati	Tuna purse seiner	12		1	2	8	
Korea (Republic of)	BUNKER	10			2	7	
Korea (Republic of)	FISH CARRIER	35			12	7	
Korea (Republic of)	Longliner	1			1		
Korea (Republic of)	Tuna longliner	193	1	14	53	65	
Korea (Republic of)	Tuna purse seiner	35			15	36	
Liberia	FISH CARRIER	8			1		
Marshall Islands	BUNKER	5			2	2	
Marshall Islands	FISH CARRIER	1			2	1	
Marshall Islands	Purse seiner	5			5	5	
Marshall Islands	Tuna purse seiner	5			5	4	
New Caledonia	Tuna longliner	17				17	
New Zealand	Longliner	2				1	

New Zealand	Tuna longliner	1				1	
New Zealand	Tuna purse seiner	2				2	
Panama	FISH CARRIER	77				11	
Papua New Guinea	Purse seiner	11			2		
Papua New Guinea	Tuna longliner	17			2		
Papua New Guinea	Tuna purse seiner	26			12		
Philippines	FISH CARRIER	250			53	58	
Philippines	MOTHERSHIP	7				3	
Philippines	Purse seiner	53			9	19	
Philippines	Support Vessel	368			3	28	
Philippines	Tuna mothership	1			1	1	
Philippines	Tuna purse seiner	97			21	8	
Spain	FISH CARRIER	1			1	1	
Spain	Tuna purse seiner	26			4	4	
Chinese Taipei	Purse seiner	70				1	
Chinese Taipei	Tuna longliner	1,524			6	2	
Chinese Taipei	Tuna purse seiner	32			8	2	
United States of America	Freezer Longliner	3			3	2	2
United States of America	Longliner	6			4	6	3
United States of America	Pole and line	6			2	3	1
United States of America	Troller	13			1	4	1
United States of America	Tuna longliner	145			109	130	55
United States of America	Tuna purse seiner	40				2	
Vanuatu	FISH CARRIER	27			13		
Vanuatu	Longliner	48			24		
Vanuatu	Tuna longliner	53			2	1	
Vanuatu	Tuna purse seiner	5			2		
<b>Total</b>		<b>4,741</b>	<b>1</b>	<b>15</b>	<b>683</b>	<b>879</b>	<b>103</b>

CCMs approved MTUs as at 22<sup>nd</sup> August 2015.

MTU Manufacturer	Model	JP	US
Anritsu	RSS405A	3	2

MTU Manufacturer	Model	CA	CN	CK	EC	FJ	ID	JP	KI	KR	NZ	PA	PH	TW	US	VU
ARGOS	MAR-GEV2				3	2	2	109	2	2			5	107		14
CLS ARGOS	FVT		1							1				49	1	1
CLS ARGOS	LEO	1								5		3	75	19		9
CLS ARGOS	MAR-GE						38	84		7			1	9		2
CLS ARGOS	Thorium TST 100	2	2	1		4				35	1		17	30	113	35
		<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>6</b>	<b>40</b>	<b>193</b>	<b>2</b>	<b>50</b>	<b>1</b>	<b>3</b>	<b>98</b>	<b>214</b>	<b>114</b>	<b>61</b>

MTU Manufacturer	Model	CA	CN	CK	FJ	NZ	PH	PG	TW	US	VU
Faria - Watchdog	750 VMS	6		1	2		12	2		20	
Faria - Watchdog	750 VMS SB	1	5		2		13	3	1	3	3
Faria - Watchdog	750 VMS W/VTerm			1				1		1	
Faria - Watchdog	750 W/TERM GWD013	1				1				12	
Faria - Watchdog	750 W/VTERM									1	
		<b>8</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>25</b>	<b>6</b>	<b>1</b>	<b>37</b>	<b>3</b>

MTU Manufacturer	Model	AU	CN	CK	EC	ES	FJ	FM	JP	KR	KR	NC	NL	NZ	PA	PH	PG	PT	TV	TW	VU
Furuno	FELCOM 16	4	104	7	2		8	1	305	7	95		1	3	3	1	1		1		3
Furuno	FELCOM 12		8					2	70			4			1		1	1			
Furuno	FELCOM 15		6			3			15		1									3	1
Furuno	FELCOM 18					1			1												
		<b>4</b>	<b>118</b>	<b>7</b>	<b>2</b>	<b>4</b>	<b>8</b>	<b>3</b>	<b>391</b>	<b>7</b>	<b>96</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>4</b>

MTU Manufacturer	Model	CK	FJ	FM	JP	MH	NL	PA	TV	TW	VU
JRC	JUE-75C			1	34			1			
JRC	JUE-75C-FFA				30						
JRC	JUE-85				17			1			1
JRC	JUE-95C				1						
JRC	JUE-95VM	1	1	1	82	2	1	6	1	1	7
		<b>1</b>	<b>1</b>	<b>2</b>	<b>164</b>	<b>2</b>	<b>1</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>8</b>

MTU Manufacturer	Model	ID
PT. SOG Indonesia	DMR-800 D/D2	38

MTU Manufacturer	Model	CN	KI	KR	SV	TW	VT
Sailor	H1622D	1					
Sailor	Sailor-6140	52	1	1	1	36	1
		<b>53</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>36</b>	<b>1</b>

MTU Manufacturer	Model	CN	KI	KR	SV	TW	VU
Sailor	H1622D	1					
Sailor	Sailor-6140	52	1	1	1	36	1
		<b>53</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>36</b>	<b>1</b>

MTU Manufacturer	Model	AU	CA	CN	CK	EC	ES	FJ	FM	ID	JP	KI	KR	LR	MH	NC	NZ	PA	PH	PG	SV	TH	TV	TW	US	VU
Thrane & Thrane	Sailor 6140			8																				6		1
Thrane & Thrane	SAILOR 6150			7	1							1	1			1										
Thrane & Thrane	TT-3020C										1													47		1
Thrane & Thrane	TT-3022D	42	1	88	4	1		4	27			10	11		2	13	1	6	7	10			4	272		20
Thrane & Thrane	TT-3026					1												1		1				122	17	
Thrane & Thrane	TT-3026D	11	1	21	1				3			2	3	1		1		5						1	8	2
Thrane & Thrane	TT-3026S			73	1	1	4	1	1		3	10	2		3			5		1	2	2	3	206		14
Thrane & Thrane	TT3027D	2		8																						1
Thrane & Thrane	TT-3062D	10	1	1						1	4													1		
Thrane & Thrane	TT6150			3																				3		
		<b>65</b>	<b>3</b>	<b>209</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>31</b>	<b>1</b>	<b>8</b>	<b>23</b>	<b>17</b>	<b>1</b>	<b>5</b>	<b>15</b>	<b>1</b>	<b>17</b>	<b>7</b>	<b>12</b>	<b>2</b>	<b>2</b>	<b>7</b>	<b>658</b>	<b>25</b>	<b>39</b>

MTU Manufacturer	Model	AU	CN	JP	KI	KR	MH	NZ	PA	PH	PG	TW	US	VU
Trimble	TNL-7001	2	10	2	4	9	1	1	1		1	28	1	9
Trimble	TNL-7002									1			3	
Trimble	TNL-7005	1	3					1				1	3	2
		<b>3</b>	<b>13</b>	<b>2</b>	<b>4</b>	<b>9</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>29</b>	<b>7</b>	<b>11</b>