

## MARITIME TECHNOLOGY COOPERATION CENTRE IN THE PACIFIC (MTCC-PACIFIC)

CAPACITY BUILDING FOR CLIMATE MITIGATION IN THE MARITIME SHIPPING INDUSTRY  
THE GLOBAL MTCC NETWORK (GMN) PROJECT

### KIRIBATI NATIONAL WORKSHOP ON ENERGY EFFICIENT OPERATION OF SHIPS

Tarawa, Kiribati

21-22 June, 2018



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## EXECUTIVE SUMMARY

The First National Workshop (NW) on Energy Efficient Operations of Ships (SEEO) was held in Tarawa, Kiribati from 20-21 June 2018. The workshop was coordinated and facilitated by the Maritime Technology Cooperation Centre in the Pacific (MTCC-Pacific) and attended by representatives from the Ministry of Information, Communication, Transport and Tourism Development (MICTTD) Maritime Transport, Police, Training College (MTC), Port Authority and Kiribati Oil (KOIL) Terminal, and private shipping companies. The list of participants is attached in Annex 1.

The purpose of the NW was to gain from the Kiribati government, its maritime administration and ship operator's agreement to measures to improve SEE in Kiribati. Also, to provide them with technical tools to progress toward SEEOs to comply with the recent Marine Environment Protection Committee (MEPC) Resolution 72 (9-13 April 2018) 'IMO Strategy' to reduce greenhouse gas emissions by up to 50% by 2050 compared to 2008. The NW agenda is attached in Annex 2.

The NW was held in two parts; the first day consisted of discussions on the initial Drivers-Needs-Barriers-Actions (D-N-B-A) Matrix to identify what is important to Kiribati's MTS. Then a comprehensive coverage on shore to ship interactions was presented. The second part consisted of technical matters relating to SEEO; climate change, greenhouse gas emissions (GHGE) and Shore to Ship Energy Management measures. There was capacity building on the Energy Efficiency Design Index (EEDI), Energy Efficiency Operational Indicator (EEOI), Ship Energy Efficiency Management Plan (SEEMP) and potential technologies to reduce and improve energy use performance e.g. Photo voltaic (PV) solar power, Light Emitting Diodes (LED), Propeller Boss Cap Fins (PBCF), Waste Heat Recovery System (WHRS) and such.

This culminated in a closing group discussion to finalise feedback from the participants. The participants agreed to implement relevant actions to progress toward a Sustainable Transport Industry with a focus on SEE and Green Port programs in Kiribati in order to support a long-term objective for low-carbon maritime transport and contribute to the reduction of GHG emissions in Kiribati and the Pacific region. The NW Outcome document is attached in Annex 3.

All NW presentations are attached in Annex 4 in consecutive order as outlined in the Agenda.

## INTRODUCTION

The National Workshop (NW) on Energy Efficient Operations of Ships (SEEO) was held in Tarawa, Kiribati from 21-22 June 2018. The meeting was coordinated and facilitated by the Maritime Technology Cooperation Centre in the Pacific (MTCC-Pacific) and attended by representatives from Kiribati maritime transport sector (MTS) shore and ship operators. The list of NW participants is attached in Annex 1.

The purpose of the NW was to gain the Kiribati government, their maritime administration and ship operations to agree on measures to improve energy efficiency of shipping (SEE) in Kiribati and provide them with technical tools to progress toward SEE. The national workshop agenda is attached in Annex 2.

The NW provided capacity building in the areas of ship energy efficiency operations (SEEO), operational measures (SEEOM), management plans (SEEMP) and systems (SEEMS). However, the initial key Pilot Project on SEE is based on the critical need for data collection (DC). The significant 'Outcome' process and resulting document was developed to enrol and enhance the local Kiribati MTS who agreed to provide the essential baseline data on fuel oil consumption (FOC) for up to six months in order to gain an understanding of where they are now and then determine what could be done to improve SEE, reduce fuel, costs and greenhouse gas emissions (GHGE). In order to manage anything you need to first measure it- 'Measure to Manage'!

This ultimately fulfils the vision of the International Maritime Organization (IMO) implemented and European Union (EU) funded Global MTCC Network (GMN) for climate change mitigation established to assist the MTS of Small Island developing states (SIDS) and least developed countries (LDC).

A media release was sent out at the end of the workshop noting the commitment of the participants to address issues affecting domestic shipping in Kiribati, within their Exclusive Economic Zone (EEZ is 200nm from their Territorial Sea Baseline) taking into consideration the need to contribute to national efforts in reducing GHGE, for SEEO and implement 'Ship and Shore' energy efficiency measures. Several tweets/retweets and posts/re-posts were also sent out on social media. Attached in Annex 5 are examples of communication and visibility activities that took place during the workshop.

*Group Discussions (Mark Davis, Transport GHG Emissions Adviser, Ore Toua, Maritime Training Adviser, Dr. M. A. Zullah, Maritime Industry Energy Efficiency Officer and ably interpreted and facilitated by the Kiribati born Team Leader and Pacific Island Domestic Ship Safety (PIDSS) Adviser, SPC)*

The facilitator opened the floor for discussion and the following notes were recorded:

- Training budget- while grateful for SPC provided training, demonstrated by high turn-out, there was concern about ongoing training availability.
- Fuel quality, cost and availability- despite the single oil company provider there were concerns that there was no quality assurance, that prices were controlled by a monopoly and were an isolated small user unable to gain security of supply unless aligned with similar regional PIC partners.
- Regulations- the Marine Department thought that the law itself needed to be tighter however compliance is the critical issue.
- Maintenance- access to affordable, reachable and quality maintenance facilities in neighboring PICs?
- Consultation- Ship Owners/operators concerned about not being consulted about new regulations and ability to meet these over a longer transition phase.



## Ship Energy Efficiency Operations (SEEO) Challenges & Ship Owner Issues with reference to the Drivers-Needs-Barriers-Actions (D-N-B-A) Matrix (*Mark Davis, Transport GHG Emissions Adviser, SPC*)

The Drivers-Needs-Barriers-Actions (D-N-B-A) Matrix was developed through group discussions

Group Discussion (focused on the issues raised above and included in the D-N-B-A Matrix):

- Training
- Fuel cost
- Regulations
- Maintenance
- Consultation-

## Energy Efficiency Operations Indicator (EEOI) on Data collection

The project will initially commence with the data collection of fuel oil consumption (FOC). Templates for this have been developed by MTCC-Pacific. The data serves to provide MTCC-Pacific with a way of quantifying GHGs and will be used to build a baseline to enable the design of suitable technology and operational activities that will assist in reducing GHGs.

Group Discussion

- The simplicity of the requirements for reporting were not different from the normal ship logs e.g. cargo weight, voyage distance and time, and FOC that allow the EEOI to be calculated. It was reiterated that it follows on from the PIDSS SOP under the SEEMP, is voluntary, is confidential and provides a non-dimensional figure (commercial-in-confidence) based on an individual ships performance, but it requires at least 10 voyages over the same route to provide anything meaningful.

Table 1 Matrix of Drivers, Needs, Barriers and Actions (D-N-B-A).

Drivers	Needs	Barriers	Relevant action
<i>Kiribati National Workshop on Energy Efficient Operations of Ships, Tarawa, Kiribati, 21-22 June 2018</i>			
Capacity Building (C-B) e.g. HR Development and Awareness of Training opportunities	<ul style="list-style-type: none"> <li>• HR development</li> <li>• Continuity of maritime expertise within 'Maritime Department'.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of higher crew qualification</li> <li>• Limited on-ground inspection resources due to insufficient trained personnel.</li> </ul>	<ul style="list-style-type: none"> <li>• Building an adaptive capacity that will ensure application of PIDSS, Safe Operational Plan (SOP) &amp; SEEMP measures on board domestic vessels.</li> <li>• Government support for increasing trained personnel.</li> </ul>
Carbon based incentives	<ul style="list-style-type: none"> <li>• To reduce GHGEs and conserve FO</li> </ul>	<ul style="list-style-type: none"> <li>• Lack understanding of marine impacts.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide incentives (time in lieu, bonus, promotions) to crews to improve voyage efficiencies.</li> </ul>
Costs of fuel	<ul style="list-style-type: none"> <li>• Baseline data collection (DC) to show emissions from domestic shipping.</li> <li>• Proper recording of the fuel on-board and fuel discharge at smaller islands.</li> <li>• Responsible person appointed.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of enforcement by operators on paper work.</li> <li>• Lack of knowledge on the benefits and importance of data logging.</li> <li>• Proper voyage* report/log- FOC, weight (cargo, pax &amp; BW), time and distance (nm).</li> <li>*point to point.</li> </ul>	<ul style="list-style-type: none"> <li>• Captain conduct tool box meeting prior to departure of vessels.</li> <li>• Implement safety &amp; energy management with the support of SPC (PIDSS and MTCC-Pacific)</li> <li>• Improve practices &amp; implement SOP &amp; SEEMP under the PIDSS program.</li> </ul>
Improve reliability, safety and efficiency of domestic shipping	<ul style="list-style-type: none"> <li>• Appropriate/relevant legal, regulatory and technical measures adapted to the size of the vessels and the capacity and resources of Kiribati (currently undergoing regulatory review by Maritime NZ and PIDSS team).</li> <li>• Training on safety, efficiency including SEEMP.</li> </ul>	<ul style="list-style-type: none"> <li>• Under-regulated &amp; not locally adapted</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of measures adapted to the Pacific domestic fleet.</li> <li>• Control domestic fleet cargo &amp; pax loading and pre-inspection /limitation based on load lines.</li> <li>• C-B of ship operators and crews on SEE measures and practises.</li> <li>• Biosecurity inspection.</li> <li>• Combined enforcement activities e.g. Maritime institutions for marine pollution.</li> </ul>
Legislation, Regulations and standards for domestic ships including safety, training, pollution prevention and efficiency	<ul style="list-style-type: none"> <li>• Awareness of compliance issues through the Maritime Department</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of support to provide information and technical tools on SEE.</li> </ul>	<ul style="list-style-type: none"> <li>• Technical support and capacity building provided by PIDSS &amp; MTCC-Pacific, and other teams from SPC-SPREP to implement measures</li> <li>• Incentives for SEE e.g. bonus.</li> </ul>
Insufficient specialised staff	<ul style="list-style-type: none"> <li>• Lack of training</li> <li>• Retention of experienced staff</li> </ul>	<ul style="list-style-type: none"> <li>• Kiribati and IDOs (IMO, ADB etc.) funding</li> </ul>	<ul style="list-style-type: none"> <li>• PIDSS (2010) &amp; MTCC-Pacific (2017) SEEO working in conjunction introduced by SPC in the Pacific region.</li> </ul>

## DAY 1: TECHNICAL WORKSHOP

The following are the NW modules presented by the three MTCC-Pacific trainers as per the Agenda (Annex 1).

### 1 Ship Energy Efficiency Operations (SEEO) Challenges & Ship Owner Issues- D-N-B-A Matrix *(Mark Davis, Transport Greenhouse Gas Adviser, SPC)*

#### Discussion

The following points (as above) came out of the discussion from this session:

- Training
- Fuel quality, cost and availability
- Regulations
- Maintenance
- Consultation

### 2 SEEO & GHGE Management to Operation *(Mark Davis, Transport Greenhouse Gas Adviser, SPC)*

This session covered the origins of air pollution (Airpol), climate change (CC) and GHGEs, international global response; international shipping response and the main IMO instruments and historical developments.

#### Discussion

The following points came out of the discussion within this session:

- The impact of climate change in Kiribati is nothing new for the participants. They are well aware of the issue and have seen climate adaptation projects implement by grants. However, participants acknowledged the need to support MTCC-Pacific's role in the region and were receptive of information presented.

### 3 SEE Regulations & Related Guidelines *(Mark Davis, Transport Greenhouse Gas Adviser, SPC)*

#### Discussion

The following points came out of the discussion within this session:

- The marine department representative updated the participants of the existing and new regulations coming into effect. He also highlighted the lack of basic ship regulations knowledge since some of the new ship operators do not have shipping background thus, the marine department will do more to support and promote existing and new regulations through media.

#### 4 Ship-Board Energy Management *(Dr. M. A. Zullah, Maritime Industry Energy Efficiency Officer, SPC)*

This session focused on the following aspects of ship-board energy management: ship-board organisation, roles and responsibilities; overview of main SEEMs; trim optimisation, its impact and best practice; ballast water management; hull and propeller roughness and fouling; engines and machinery utilization management; fuel management: storage, treatment and purification; technology upgrade;

##### Discussion

The following points came out of the discussion within this session:

- Since the inception of the PIDSS programme in Kiribati, many ship operators have been trying to develop safe operational plan (SOP) and the maintenance plan. The revised SOP has been integrated with SEEMP and data collection. A follow up visit is planned for all the ship operators in attendance.
- The participants also highlighted that the high cost of maintenance in Kiribati leads to unconventional methods being applied to operate the vessels. Maintenance plans are not following frequently due to the non-availability of parts or due to non-availability of qualified engineers.

#### 5 Ship-Port Interface & Energy Efficiency *(Ore Toua, Training Adviser, SPC)*

This session introduced ports and port area emissions, ship time in port (TIP) and just-in-time (JIT) operations; technologies for port air quality/GHGe reductions; ship in-port operational energy efficiency measures (OEEM); and onshore power supply (OPS)/cold ironing.

##### Discussion

The following points came out of the discussion within this session:

- Need to minimize TIP by JIT operations to minimize overall GHGe's. Potential for OPS once Kiribati fully supplied by solar powered renewable energy under their 100% by 2025 target.

#### 6 Energy Management Plan (EnMP) & System (EnMS) *(Mark Davis, Transport Greenhouse Gas Adviser, SPC)*

This session provided a brief overview of various ship-board management systems; company level energy management; energy audits and reviews, types and processes; and ship performance, monitoring and voyage performance analysis. Only a brief description of this topic was covered with an expectation that it would be covered in more detail in Day 2.

##### Discussion

No feedback.



## DAY 2: TECHNICAL WORKSHOP

All Day 2 sessions are usually presented by Dr. M. A. Zullah, Maritime Industry Energy Efficiency Officer, however due to late arrival some were provided by Mark Davis).

### 7 Energy Efficiency Design Index (EEDI) Guideline

This session provided an overview of the EEDI formula; EEDI calculation parameters; EEDI factors and correction factors; and example of a sample EEDI calculation

#### Discussion

- Kiribati ship operators are interested to calculate the EEDI of their vessels but they do not have the ship drawings and most of the machinery specifications are unknown.
- Vessel owners will now request for the EEDI of vessels before purchasing the vessel from foreign countries.

### 8 Ship Energy Efficiency Management Plan (SEEMP) Guideline

In this session, the main elements of SEEMP, implementation aspects and EEOI calculation process was covered.

#### Discussion

- In Kiribati, SEEMP is integrated with the SOP and it will be regulated soon. Data collection and SEEMP measures on board the vessels will be practiced together with the SOP.
- During the SOP audit, MTCC-Pacific will assess the implementation of the SEEMP measures and consistencies of the data collection.
- The driving factor of the Kiribati ship operators is financial gains and they can understand the importance of the SEEMP in conserving fuel and reducing their operational cost.
- The data collection template has been further simplified for the ship operators to collect fuel oil data at port and during steaming. This will provide them of insight, and ideas on how the fuel consumption can be reduced during particular operations.

### 9 Ship Energy Efficiency Operations (SEEO) Measures

This session focused on operational energy efficiency measures with respect to operational management-JIT; maintenance and condition monitoring; auxiliary load management; trim/ballast optimization; hull and engine conditions; and system planning and reduced demand.

#### Discussion

- Most of the passenger/ cargo or cargo operators agree that the outbound voyages are more economical than the inbound voyages. The outbound voyages have high volume cargo but the inbound voyages have only few passengers.
- Reducing speed on the inbound voyages could reap some benefits on decreasing fuel consumption but this can only be achieved through data collection and measure the ship efficiency on different operating conditions.

- One of the other measures they are interested in is keeping the vessels hull clean through continuous observations and have a proper maintenance plan. The hull rough could also be picked from the fuel oil consumption analysis.
- Optimizing the trim for each voyages seems like a good approach but most of the ballast pumps are not working on the vessels.

## 10 Ship Energy Efficiency (SEE) Technical Measures

This presentation focused on EEDI reduction method; ship hydrodynamics; propeller and propulsion system; engines and power systems; auxiliary machinery; economic assessment; and a case study on futuristic concept ships.

### Discussion

- Currently, there are few vessels in Kiribati that have installed the solar system to charge deck equipment batteries and lights. The full potential of the solar system onboard the vessel has not been realized yet due to lack of knowledge on wider application of the solar system
- Most of the vessels utilize a small portable generator at harbor for lights and reefers.
- Solar systems is considered as an option but due to the high price, ship owners opt for generators which can be fixed and replaced easily.
- Yanmar is a common engine used on Kiribati operated vessels but operators face a lot of issues with spare parts. Currently, they parts are ordered from Australia which is quite costly.

## 11 Further SEE Measures

This session focused on the development of DCS for FOC; DC; data analysis; and lastly followed by decision making on what further measures are required, if any.

### Discussion

- Ship operators do not have a proper maintenance plan and main spare parts inventory lists. Through SOP, the ship operators will develop proper checklists for machinery checks and keep records of previous maintenances.

## 12 Potential Fuel-oil Consumption (FOC) & Green-house Gas Emission (GHGE) Reductions (Mark Davis, Transport Greenhouse Gas Adviser, SPC)

This session explored the introduction and forecasting scenarios; simulation models; FOC and fuel cost forecasting.

### Discussion

- The participants are well aware of the climate change and impact but less aware on the climate mitigation measures. The marine departments is strengthening all the IMO adopted protocols to the vessels operators to adhere to safety and also the efficiency.

### 13 Light Emitting Diodes (LED) *(Mark Davis, Transport Greenhouse Gas Adviser, SPC)*

This presentation focused on LED lightings, its efficacy and the cost evaluation of LED. LEDs for lighting solutions are gaining increasing importance in the shipping industry, based on their energy-saving potential and long service life. Any reduction in electricity consumption for lighting leads to a positive impact on the ship's operating costs, as well as reducing the environmental impact.

#### Discussion

- The LED lights are being replaced on board the vessels but due to the high cost, the rate of implementation is slow. Most operators prefer to replace the bulbs as it is cheaper and faster.
- Having a solar system with LED lights would be very beneficial for night lights and also engine rooms lighting.

### 14 Shaft Generators

This session focused on what a shaft generator is; vessels currently using shaft generators; energy saving; cost effectiveness and risk.

#### Discussion

- At least 2 vessel operators has mentioned the vessel is equipment with shaft generator but no longer operational. One of the operators (mlc North Star) will be fixing the shaft generator in Marshal Islands in the coming months.

### 15 Waste Heat Recovery Systems (WHRS)

This presentation focused on heat balance for engine without and with WHRS; PTG (Power Turbine & Generator) WHRS; STG (Steam Turbine & Generator) WHRS; and PT-ST combined waste heat recovery systems.

### 16 Wrap-up & Overview *(Dr. M. A. Zullah, Maritime Industry Energy Efficiency Officer, SPC)*

The final day was focused on presenting, reviewing and adopting the *Outcomes* statement developed from two days of deliberations. This was also an opportunity for ship owners to express their views on the MTCC-Pacific program.

MTCC-Pacific provided a summary on the deliberations of the NW:

- Good overall attendance.
- Group discussion on issues relating to SEEO.
- Discussion on CC, GHGE and S/SEM measures.
- Interactive knowledge transfer on EEDI, EEOI, SEEMP and PIDSS.
- Energy saving devices such as PBCF, LED, WHRS, SG and PV.

**17 Review of Outcomes Document** *(Dr. M. A. Zullah, Maritime Industry Energy Efficiency Officer, & Mark Davis, Transport Greenhouse Gas Adviser, SPC)*

MTCC-Pacific presented a draft Outcome document for review and adoption; after edits were made. The Outcome document was then adopted with the consideration that slight wordsmithing may take place. The finalized document is attached in Annex 3.

**18 Closing Remarks** *(Capt. Ruoikabuti Tioon, Director of Marine, Ministry of Information, Communications, Transport and Tourism Development, Kiribati)*

On behalf of the Kiribati government, Capt. Ruoi thanked PIDSS & MTCC-Pacific from SPC for organizing the NW on SEEO. He thanked all the participants for attending and supporting PIDSS & MTCC-Pacific with their programs. He reiterated the importance of the data collection and contribution towards GHGE reduction and uptake of SEEO. Kiribati's have been championing climate mitigation in international discussions and would like to see people's behaviour change toward conservation of energy use generally in Kiribati. Capt. Ruoi also acknowledged the issues raised by the participants and informed them that the Marine Department will be doing its best to address them.



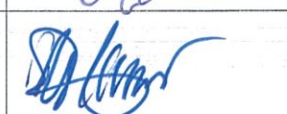
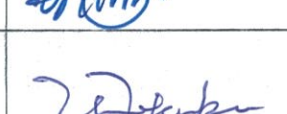






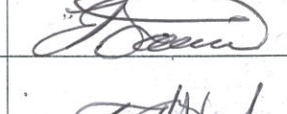
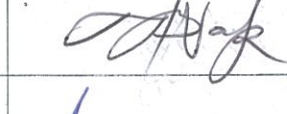
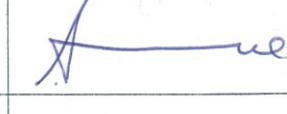
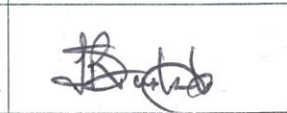
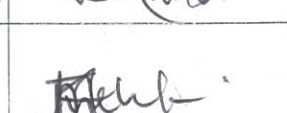
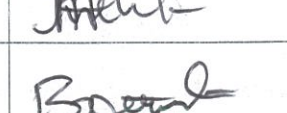


# ANNEXES

## ANNEX 1: Signed List of Participants



**NATIONAL WORKSHOP ON ENERGY EFFICIENT OPERATION OF SHIPS TARAWA KIRIBATI, 21/06/2018**

	Name	Job Title	Organisation	Gender	Line 1 address	City	Telephone	Mobile Number	Email Address	Source of Funding	Role	SIGNATURE
1	TIMAU KAIKAI	MANAGER	TE MATAU SHIPPING CS	M			72050359		guadalupelmaia@gmail.com	In-country	Participant	
2	TETOMA U	Vsl. MASTER	TIMEON BETA SHIPPING	M			73014330			In-country	Participant	
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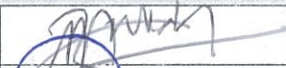




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26	RIENNANG IONE	SAR COORDINATOR	MARINE	M			73097992		riennang.ione@mcttd.gov.ki	In-country	Participant	One
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31										In-country	Participant	
32										In-country	Participant	
33										In-country	Participant	
34										In-country	Participant	



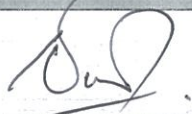















35										<a href="#">In-country</a>	Participant	
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38										<a href="#">In-country</a>	Participant	
39												
40										<a href="#">In-country</a>	Participant	

#### THE PACIFIC COMMUNITY STAFF


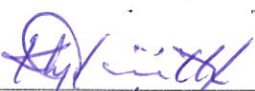
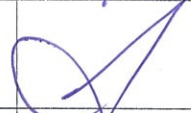






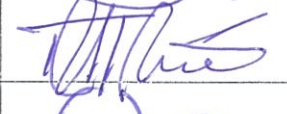
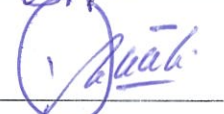

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**NATIONAL WORKSHOP ON ENERGY EFFICIENT OPERATION OF SHIPS TARAWA KIRIBATI, 22/06/2018**

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32									In-country	Participant	
33									In-country	Participant	
34									In-country	Participant	





## ANNEX 2: Agenda



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**MTCC-PACIFIC – Kiribati National Workshop on Ship Energy Efficient Operations (SEEO)**

**Tarawa, Kiribati 21<sup>st</sup> ~ 22<sup>nd</sup> June, 2018**

**PROGRAMME**

Time	Agenda item	Agenda issues	Presenters
<b>Day 1 – 21<sup>st</sup> June, 2018 – Technical Workshop (Ship Energy Efficient Operations)</b>			
0800		<b>Registration</b>	
0830		<b>Welcome Addresses: Secretary MTCC-Pacific Transport Greenhouse Gas Adviser</b>	
0900 – 1030	1	Ship Energy Efficiency Operation (SEEO) Challenges- Ship Owners Issues- Discussion of N-B-R-A Matrix: 'Outcome'	MTCC-Pacific
	2	Ship Energy Efficiency Regulations and Related Guidelines - Introduction to ship roles and responsibilities	MTCC-Pacific
1030-1100		<b>Tea Break</b>	
1100 – 1230	3	Ship Management to Operation - Origins of air pollution (airpol) and climate change (CC) - CC and GHG emissions (GHGE) - International global response - International shipping response - Main IMO instruments and historical developments	MTCC-Pacific
	4	Ship-Board Energy Management - IMO regulatory framework (FW)- ship energy efficiency (SEE) - MARPOL Annex VI Chapter 4 - Brief introduction to SEEMP GL - Brief introduction to SEE Operations Index (EEOI) GL	MTCC-Pacific
1230 – 1330		<b>Lunch</b>	

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1330- 1500	5	Ship-Port Interface and Energy Efficiency <ul style="list-style-type: none"><li>- Introduction to ports and port-area emissions</li><li>- Ship time in port and just-in-time (JIT) operations</li><li>- Technologies for port air quality (AQ)/GHGE reductions</li><li>- Ship in-port operational energy efficiency measures (OEEM)</li><li>- Onshore power supply (OPS)</li></ul>	MTCC-Pacific
	6	Energy Management Plan (EnMP) and System (EnMS) <ul style="list-style-type: none"><li>- Brief overview of various ship-board management systems</li><li>- Company level energy management</li><li>- Energy audits and reviews, types and processes</li><li>- Ship performance, monitoring and voyage performance analysis</li></ul>	MTCC-Pacific
	7	Light Emitting Diode (LED)  Shaft Generators  Waste Heat Recovery System (WHRS)	MTCC-Pacific
1500- 1530	8	Open Discussions	
1530- 1600	Tea Break		
End Day 1			

Time	Agenda item	Agenda issues	Presenters
<b>Day 2 – 22<sup>nd</sup> June , 2018 – Technical Workshop (Ship Energy Efficient Operation)</b>			
<b>0845</b>	<b>Participants arrive</b>		
<b>0900 – 1030</b>	<b>1</b>	Guidelines for EEDI <ul style="list-style-type: none"> <li>- Overview of EEDI formula</li> <li>- EEDI calculation parameters</li> <li>- EEDI factors and correction factors</li> <li>- Example of a sample EEDI calculation</li> </ul>	MTCC-Pacific
	<b>2</b>	Guidelines for SEEMP <ul style="list-style-type: none"> <li>- Main elements of SEEMP</li> <li>- Implementation aspects</li> <li>- EEOI calculation process</li> <li>- Video - Best Practice For Fuel-Efficient Operation</li> </ul>	MTCC-Pacific
<b>1030-1100</b>	<b>Tea Break</b>		
<b>1100 – 1230</b>	<b>3</b>	Operational energy efficiency measures <ul style="list-style-type: none"> <li>- Operation management</li> <li>- Maintenance and condition monitoring</li> <li>- Auxiliary load management</li> <li>- Trim/ballast optimization</li> <li>- Hull and engine conditions</li> <li>- System planning and reduced demand</li> </ul>	MTCC-Pacific
	<b>4</b>	Technical energy efficiency measures <ul style="list-style-type: none"> <li>- EEDI reduction method</li> <li>- Ship hydrodynamics</li> <li>- Propeller and propulsion system</li> <li>- Engines and power systems</li> <li>- Auxiliary machinery</li> </ul>	MTCC-Pacific
<b>1230 – 1330</b>	<b>Lunch</b>		



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1330 – 1545	5	Further measures to enhance the energy efficiency of ships - Development of a data collection system (DCS) for fuel consumption o data collection; o data analysis; and o followed by decision-making on what further measures, if any, are required	MTCC-Pacific
	6	Potential to reduce emissions and fuel consumption - Introduction and forecasting scenarios - Simulation model - Fuel consumption and fuel cost forecast	MTCC-Pacific
	Tea Break		
	7	Discussion of the workshop Outcome document	MTCC-Pacific
	8	Certificate of Attendance Awarded	Secretary
	9	Closing remarks	Secretary/ MTCC-Pacific
1545- 1600	10	Open Discussions	
1600- 1630	Closing Remarks		
End Day 2			

## ANNEX 3: Outcomes Document

# **KIRIBATI TRAINING ON PACIFIC ISLAND DOMESTIC SAFETY PROGRAMME (PIDSS) & NATIONAL WORKSHOP ON ENERGY EFFICIENT OPERATIONS OF SHIPS (SEEO)**

Tarawa, Kiribati, 19-22 June 2018

## **OUTCOME**

1. The Training on Pacific Island Domestic Ship Safety (PIDSS) programme followed by the Workshop on Energy Efficient Operations of Ships (SEEO) were held at the magnificent Marine Training Centre (MTC), from 19 to 22 June 2018. The capacity building training was organized by the Geoscience, Energy and Maritime Division (GEMD) of the Pacific Community (SPC) in collaboration with the Ministry of Information, Communications, Transport and Tourism Development. The workshop was attended by representatives from Ministry of Information, Communications, Transport and Tourism Development, Kiribati Port Authority (KPA), Kiribati Police Maritime Unit, Kiribati Oil Company Limited (KOIL), Communications Commission of Kiribati (CCK) and private shipping companies, including the Chair and Vice Chair of the Kiribati Island Ship Owners Association (KISOA). The participants list is attached in Annex A.
2. The Workshop on Energy Efficient Operations of Ships (SEEO) was delivered by the Maritime Technology Cooperation Centre in the Pacific (MTCC-Pacific). MTCC-Pacific is hosted by SPC and the Secretariat of the Pacific Regional Environment Programme (SPREP) and forms part of the Global MTCC Network (GMN), a project implemented by the International Maritime Organization (IMO) and funded by the European Union with the aim of building the capacity of developing countries for climate mitigation in the maritime industry.
3. The opening address was delivered by the Acting Officer in Charge of MICTTD and Director of Marine, Capt. Ruoiabuti Tioon who welcomed the participants and recalled that maritime safety is an absolute priority for Kiribati after the mv Butiraoi disaster earlier this year where nearly 100 people perished and therefore this national workshop is a great opportunity to discuss a number of priority areas including challenges and opportunities in the domestic maritime transport sector, nurturing a safe and sustainable shipping culture in Kiribati by implementing the PIDSS and MTCC-Pacific programs and contributing to safe maritime transport and Green Port Initiatives.
4. Team leader of SPC GEMD team in this mission, Mr. Omirete Tabureka, gave thanks to the Marine Division and MICTTD for facilitating these trainings/workshops, and to the participants for making the time and efforts to attend these trainings/workshops. He further reiterated on the need for ship operators to implement Safe Operational Plans integrated with Ship Energy Efficiency Management Plans (SEEMP) for safe and efficient sea transportation. The PIDSS programme was actually inceptioned in 2010, following the tragic accidents which happened in Kiribati and Tonga almost simultaneously, with the ultimate goal of strengthening maritime safety on domestic vessels and establishing safety culture in the region.
5. The purpose of the training was to bring together representatives from the maritime transport sector to discuss and agree on a common approach to improve domestic shipping safety and energy efficiency e.g. lower fuel oil consumption, save money and reduce greenhouse gas (GHG) emissions in the Kiribati maritime transport sector. The objective was also to agree on measures to improve SEEOs and provide participants with technical tools and methods to progress toward SEEO measures.

**The Participants:**

6. Acknowledged the formation of the Kiribati Women in Maritime Association (KWIMA), the appointment of the interim Executive Committee members that are committed to facilitate women and youth's contribution to the maritime transport sector in Kiribati. The KWIMA Executive Committee and members are listed in Annex B.
7. Recognised that KWIMA has resources and stakeholder partners to progress and encourage women's employment opportunities in maritime and by extension, our communities.
8. Agreed to participate in the MTCC-Pacific pilot-project on uptake of energy efficient technologies in conjunction with the PIDSS Programme;
9. Agreed to continue efforts to implement Safety Management Systems (SMS), Safe Operation Plans (SOP) and Ship Energy Efficiency Management Plans (SEEMP) on board domestic ships in Kiribati under the PIDSS and MTCC-Pacific Programmes;
10. Agreed to strengthen activities of Kiribati Islands Ship Owners Association (KISOA) to lead the maritime sector toward safe and efficient operations in collaboration with the Marine Division;
11. Agreed to collect fuel oil consumption data to inform further action on SEEOs in Kiribati.

22 June 2018



## ANNEX A – PARTICIPANTS LIST OF MTCC-PACIFIC WORKSHOP

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13	Tuhiwai Titaake	Seafarer & Ship Clerk Marine Division	Office : (+676) 74026003 Email : <a href="mailto:tuhitaake007@gmail.com">tuhitaake007@gmail.com</a>	F
14	Baroo Buren	Laundress Marine Training Centre P O Box 511, Betio, Tarawa, Kiribati	Office : (+676) 7512 6080 Mobile : (+676) 7309 2321 Email : <a href="mailto:barooburen@gmail.com">barooburen@gmail.com</a>	F
15	Teebora Baie Bokai	Senior Accountant Kiribati Coconut Development Ltd	Office : (+676) 7512 5256 Mobile : (+676) 7305 0700 Email : <a href="mailto:teeborabaie@gmail.com">teeborabaie@gmail.com</a>	F
16	Kaboterenga.romatoa	IT Officer Communications Commission of Kiribati Tarawa, Kiribati	Office : (+676) 7512 5431 Mobile : (+676) 7301 2424 Email : <a href="mailto:kaboterenga.romatoa@cck.ki">kaboterenga.romatoa@cck.ki</a>	F
17	Tene Bonteman	General Manager Christopher Columbus Shipping , Betio	Office : (+676) 7512 5322 Mobile : (+676) 7300 5065 Email : <a href="mailto:cbline@gmail.com">cbline@gmail.com</a>	F
18	Tienimatang.Reue	Assistant Secretary MICTD	Office : (+676) 7402 6003 Mobile : (+676) 7301 1577 Email : <a href="mailto:as@mcttd.gov.ki">as@mcttd.gov.ki</a>	F

## **ANNEX C – DNBA MATRIX GROUP DISCUSSIONS**

Drivers	Needs	Barriers	Relevant action
<i>Kiribati National Workshop on Energy Efficient Operations of Ships, Tarawa, Kiribati, 21-22 June 2018</i>			
Costs of fuel	<ul style="list-style-type: none"> <li>• Baseline data collection (DC) to show GHG emissions.</li> <li>• Consistent logging of fuel, weight, distance and time.</li> <li>• Responsible person appointed.</li> <li>• Logs (MTCC templates) collected by Marine Department.</li> </ul>	<ul style="list-style-type: none"> <li>• Data collection system (DCS) database.</li> <li>• Lack of enforcement by operators.</li> <li>• Lack of staff awareness of the benefits of data logging.</li> <li>• Proper voyage* log- FOC, weight (cargo, pax &amp; BW), time (hr) and distance (nm).</li> <li>• *point to point.</li> </ul>	<ul style="list-style-type: none"> <li>• Captain conduct tool box meeting prior to departure.</li> <li>• Implement safety &amp; energy management with the support of SPC (PIDSS and MTCC-Pacific)</li> <li>• Improve practices &amp; implement SOP &amp; SEEMP under the PIDSS program.</li> </ul>
Maintenance	<ul style="list-style-type: none"> <li>• Reduce costs associated with unplanned maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of knowledge on engineering principles</li> <li>• Lack of awareness of the equipment's design life</li> </ul>	<ul style="list-style-type: none"> <li>• Create sustainable business environment for dealers</li> <li>• Develop proper maintenance plan and implement accurately</li> </ul>
Legislation, Regulations and standards for domestic ships including safety, training, pollution prevention and efficiency	<ul style="list-style-type: none"> <li>• Awareness of compliance issues through the Maritime Department</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of interest/motivation/commitment.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop maintenance and hull inspection/cleaning plan.</li> <li>• Technical support and capacity building provided by PIDSS &amp; MTCC-Pacific, and other teams from SPC-SPREP to implement measures</li> <li>• Incentives for SEE e.g. end of year bonus.</li> </ul>
Capacity Building (C-B) e.g. HR Development and Awareness of Training opportunities	<ul style="list-style-type: none"> <li>• HR development- Training</li> </ul>	<ul style="list-style-type: none"> <li>• Budget/financial support</li> </ul>	<ul style="list-style-type: none"> <li>• Building an adaptive capacity that will ensure application of PIDSS (SOP) &amp; SEEMP measures on board domestic vessels.</li> <li>• Government support for increasing trained personnel.</li> </ul>
Availability of affordable (\$), clean (QA) and sufficient quantity of fuel.	<ul style="list-style-type: none"> <li>• Support a Pacific regional purchasing mechanism.</li> <li>• Appoint a Pacific Petroleum 'Person'</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of integrated approach and support for maritime transport improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Consultation with other ministries that provides economic driver</li> </ul>
Industry consultation (KSOA) with Marine Department to steadily improve reliability, safety and efficiency of domestic shipping.	<ul style="list-style-type: none"> <li>• Appropriate/relevant legal, regulatory and technical measures adapted to the size of the vessels and the capacity and resources of Kiribati (currently undergoing regulatory review by Maritime NZ and PIDSS team).</li> <li>• Training on safety, efficiency including SEEMP.</li> </ul>	<ul style="list-style-type: none"> <li>• Under-regulated &amp; not locally adapted</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of measures adapted to the Pacific domestic fleet (transition time to implement higher standards).</li> <li>• Control domestic fleet cargo &amp; pax loading and pre-inspection /limitation based on load lines.</li> <li>• Capacity building of ship operators and crews on SEE measures and practises.</li> <li>• Combined enforcement activities e.g. Maritime institutions for marine pollution.</li> </ul>



## ANNEX 4: Workshop Presentations

(Please refer to our website:  
<http://mtccpacific.spc.int/>)

Under the Resources Tab → Documents  
→ Templates → Training materials)

## ANNEX 5: Workshop Evaluation Analysis

Maritime Technology Cooperation Centre - Pacific  
Pacific Community, Suva Regional Office  
Private Mail Bag, Suva, Fiji  
Tel: (679) 337 0733 | Fax: (679) 337 01 46  
Email: mtcc-pacific@spc.int | Web: www.spc.int

## MTCC-PACIFIC NATIONAL WORKSHOP ON ENERGY EFFICIENT OPERATIONS OF SHIPS

Tarawa, Kiribati, 21-22 June, 2018

### Arrangements prior to the activity

- 1 Was the invitation received in good time? Yes ☐ No ☐
- 2 Did you receive the information listed below about the event before your participation
  - on its objective and scope Yes ☐ No ☐
  - subject areas and programme Yes ☐ No ☐
- 3 Were the instructions on the following clear and easy to understand?
  - profile required of participant Yes ☐ No ☐
  - completion and submission of the nomination form Yes ☐ No ☐
- 4 Did you receive logistical information on
  - venue Yes ☐ No ☐

### During the activity

- 5 To cover the topics fully, was the event (*please check the appropriate box*)  
(1) too long ☐ (2) just right ☐ (3) too short ☐
- 6 How do you rate the event with regard to the following? (*tick one box in each case*)
 

	excellent	good	satisfactory	poor
Venue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- 7 How would you rate the following aspects? (*tick one box in each case*)
 

	excellent	good	satisfactory	poor	
Group discussion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A <input type="checkbox"/>
Group Feedback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A <input type="checkbox"/>
Discussion opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A <input type="checkbox"/>
- 8 How would you rate the following sessions according to the day's agenda? (*tick one box in each case*)
 

	excellent	good	satisfactory	poor	
Morning session	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A <input type="checkbox"/>
Lunch session	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A <input type="checkbox"/>
Afternoon session	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A <input type="checkbox"/>

**At the end of the activity**

- 9 Please rate each facilitator with regard to the following (*check one box in each case*)
- |                                    |                          |                          |                          |                          |                              |
|------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------------------------------|
| • delivery of presentation         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | N/A <input type="checkbox"/> |
| • ability to guide discussions     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| • effectiveness in:                |                          |                          |                          |                          |                              |
| • answering questions              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |
| • suggesting solutions to problems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                              |

- 10 What topics were of most interest and relevance to your Administration?

---

---

- 11 Are there any topics which should be added? Yes ☐ No ☐  
If yes, please list them:

---

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- 12 Do you consider that the objective of the event was met? Yes ☐ No ☐

- 13 Are the outcomes achieved likely to be useful to your Administration? Yes ☐ No ☐

- 14 Will you have the opportunity to transfer the knowledge gained to your colleagues at work? Yes ☐ No ☐

Comments:

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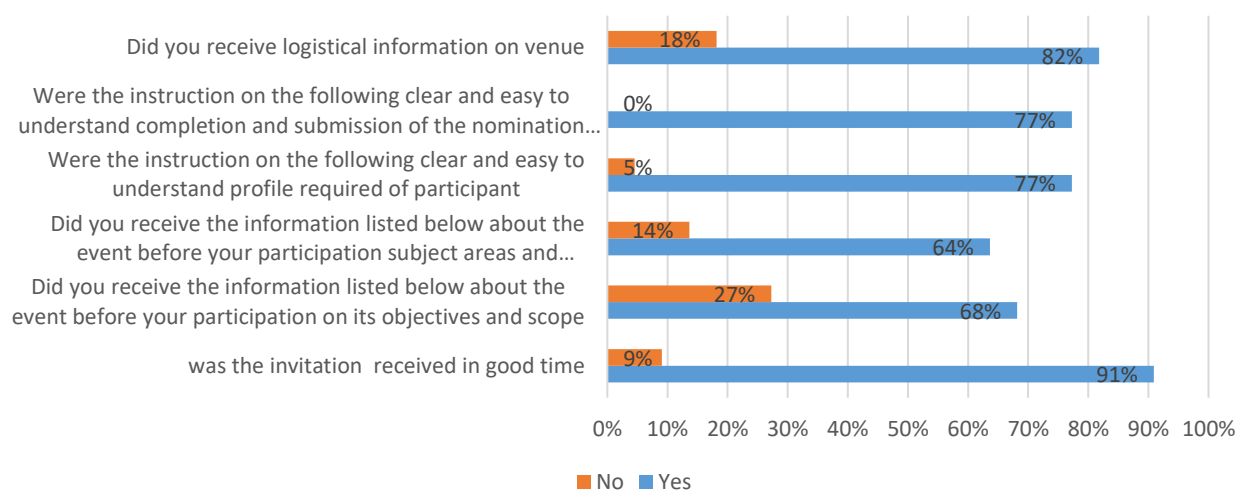
We greatly appreciate your time in completing this evaluation questionnaire. It contains important information that will assist the MTCC team in determining the success and impact of the activity.

Thank you.

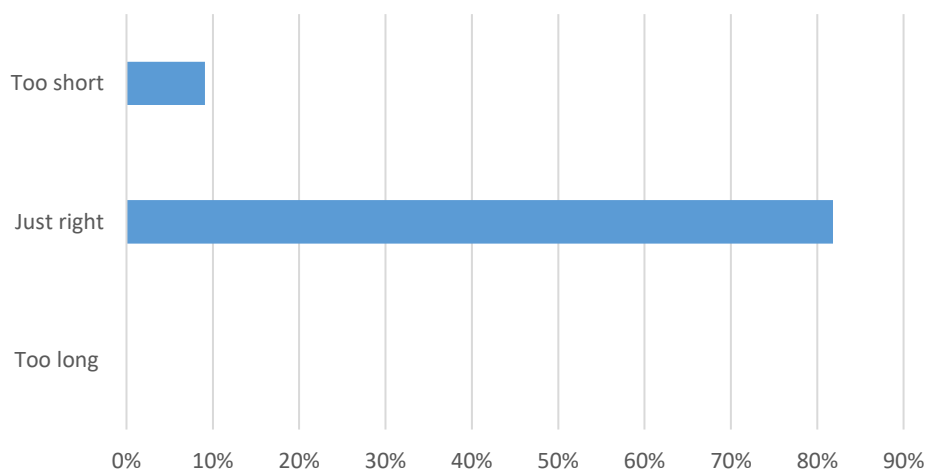


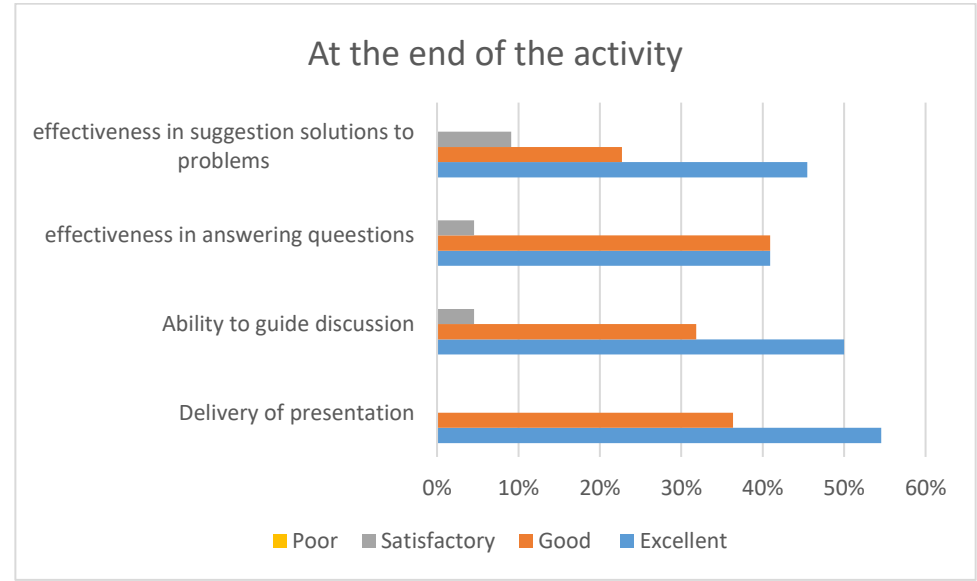
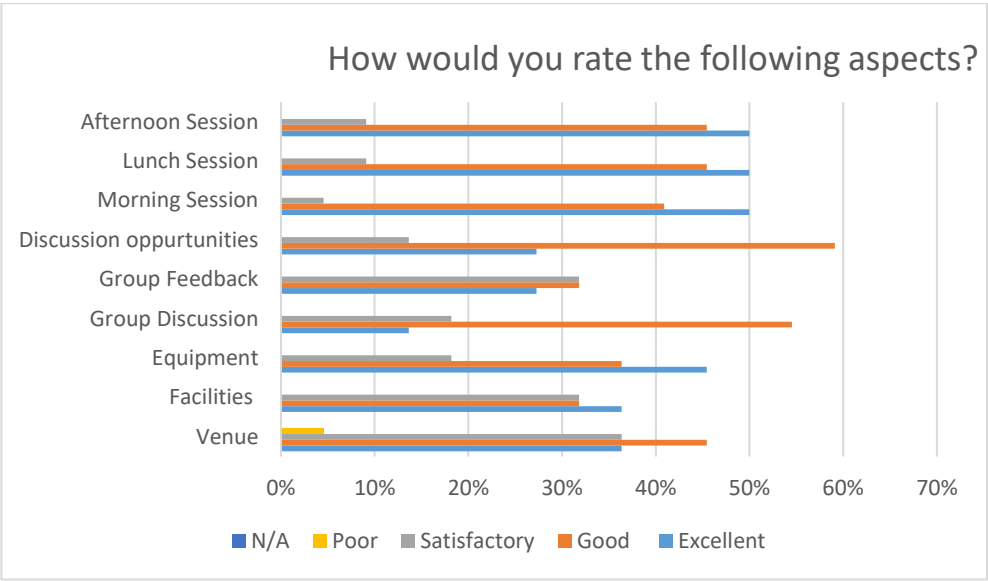
## Workshop Evaluation Analysis

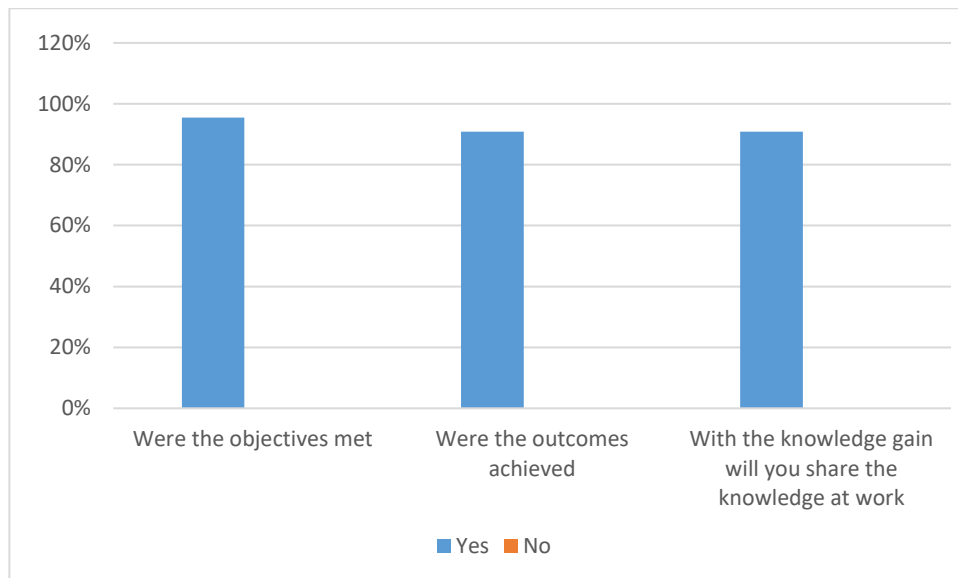
### Arrangements prior to the activity



### To cover the topic fully, was the event...







### Topic of most interest

- Maritime safety
- Greenhouse gas emission
- Ship energy efficiency management plan and operation measures
- Fuel consumption
- General safety awareness and standard operation procedures
- Energy efficiency design index
- Ship Management to Operations
- Ship Board Energy Management
- Ship safety, plan and procedures and also the formulas
- Pacific domestic ship safety training
- Drivers-needs-barriers-action matrix

### Topics that should be added

- DNBA matrix to copy to our vessel
- NYK super eco ship to copy to our vessel
- Group discussions in order to have every participant broaden their understandings.
- Sample collection/display of vessel data to actually see how EE works here in Kiribati.
- This could be communicated prior the commencement of the workshop, on a standard form. Shipping operators could provide data as it is, and later understand their own status during display/workshop.
- Detailed discussion on making SOP management
- Solving problems in fuel consumption as well as oil i.e. how PT has to work it out, if possible manually

### Additional comments

- Thank you to the SPC team for the very informative workshop. Keep it up. May God save our lovely planet Earth.
- Workshop to be conducted annually.
- May need more training to retain all the lessons learnt.
- The programme should be maintained through our region as we do experience accidents and therefore it will help to improve their planning to improve more on vessel safety.

- Very grateful to re-arrange our system through your very good services to earn more and better for our company, CPPL.
- Useful workshop for safety measures and reducing GHE but has been disturbed with office works so it would be better to have it in a distant area like resort etc.
- Useful workshop for my company in setting up plans for safety on board vessels, fuel consumption as well as taking care of the environment
- No technical background knowledge especially for us new to shipping. Workshop has given us a broader concept and to know how to drive the operation in terms of management and particularly the controlling of the technical side on board ships.
- With respect to the PIDSS training, we currently face significant challenges particularly in ship owners accepting changes to the existing national domestic ship safety programme such as the implementation of SOP as SOP will assist to improve safety, protection of property and environmental protection. With respect to MTCC-Pacific workshop, we have awareness on how we can improve the energy efficiency of our ships in a cost-effective manner. Have ideas on possible approach for improving ship and fleet efficiency performance as explained in the presentation.
- Thank you very much for the workshop/training you are conducting in Kiribati. It is very beneficial for shipping companies, vessel owners and operators.
- Handouts should also be given, as slide shows are not very clear at times with small fonts and bright room setting.



## ANNEX 6: Photos





## ANNEX 7: Communication and Visibility Activities



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Posts from friends


**Lore Croker** shared **Pacific-Community-SPC's** post.  
3 July · 🌐

Collaborative commitment from @Kiribati\_Govt and domestic shipping operators in safe and energy efficient operations in its maritime sector  
#MTCCPacific

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2 July · 🌐

Government agencies and domestic shipping operators agreed to practice ship safety and energy efficient operations in the #maritime sector at the conclusion of ...

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**To:** [press-releases@lists.spc.int](mailto:press-releases@lists.spc.int)  
**Subject:** [SPC-News] Practising maritime safety and energy efficiency in Kiribati  
**Date:** Monday, 2 July 2018 3:14:03 PM  
**Attachments:** image001.png  
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## Practising maritime safety and energy efficiency in Kiribati

02 July 2018

**Tarawa, Kiribati** – Government agencies and domestic shipping operators agreed to practice ship safety and energy efficient operations in the maritime sector at the conclusion of the four-day workshop on safe and energy efficient operation of ships held in Tarawa, Kiribati from 19-22 June 2018 in a joint collaboration of the Pacific Island Domestic Ship Safety project in conjunction with the Maritime Technology Cooperation Centre in the Pacific (MTCC-Pacific) project.

Kiribati covers 811 square kilometres consisting of 20 inhabited islands with a population of 113,000 people, 44.3% in urban and 55.7% in rural areas. The vast sea area is serviced by more than 56 registered vessels providing domestic services between the islands making the reliability, safety and efficiency of maritime transport an absolute priority. Domestic shipping services are the only, and most affordable means of transportation to provide connectivity between islands that support the socio-economic needs of communities.

The Acting Officer in Charge of the Ministry of Information, Communications, Transport and Tourism Development (MICTTD) and Director of Marine, Capt. Ruoikabuti Tioon, welcomed the Pacific Community (SPC) team and added that “the maritime transport sector is vital for Kiribati and it is important for Kiribati to take advantage of the safety and ship energy efficiency operations (SEEO) workshops and build capacity for climate mitigation. I thank MTCC-Pacific for coming here and hope they will continue to provide this kind of training to inform and educate technical staff in Kiribati.”

Mrs. Tiantaake Mariana, the interim President of the newly established Kiribati Women in Maritime Association (KWIMA) expressed her deep appreciation to SPC and participants attending the workshop and for recognising the role of women as resource and stakeholder partners in the shipping industry. Representatives from the Marine Department, Kiribati Port Authority (KPA), Kiribati Oil Company (KOIL) and Maritime Police were also present in this four-day event.

The training and workshop discussions revealed that profitability was the main driver for energy efficiency. Improving ship energy efficiency can improve profitability but maritime regulations on ship energy efficiency management plan (SEEMP) can also accelerate the speed of implementation.

SPC’s Ship Safety Audit Adviser, Capt. Omirete Tabureka, reiterated the need for the ship operators to adopt the Safe Operations Plan (SOP) integrated with the Ship Energy Efficiency Management Plan (SEEMP) for safe and efficient sea transportation in saying that “sea transportation is essential for the livelihood of the people living on the outer islands and the ship owners and captains have to take charge to provide a reliable, safe and energy efficient service.”

MTCC-Pacific is part of the Global MTCC Network (GMN), a project implemented by the International Maritime Organization (IMO), and funded by the European Union, to build the capacity of developing countries for climate mitigation in the maritime industry and thereby contributing to Kiribati’s Nationally Determined Contributions (NDC) and broader Sustainable Development Goals.

During the next week, MTCC-Pacific will follow in the footsteps of the PIDSS program and together work with ships under the PIDSS program to develop safe (SOP) and efficient (SEEMP) shipping. This is critical to ensure that ships are operating safely by adopting the best available and appropriate safe management practices and thereby make it easier to adopt complementary energy efficient operations.

### Media contacts:

Mohammed Asid Zullah, Maritime Industry Energy Efficiency Officer, [zullahm@spc.int](mailto:zullahm@spc.int) or +679 337 9634

Omirete Tabureka, SPC Ship Safety Audit Advisor, [omiretet@spc.int](mailto:omiretet@spc.int) or +679 337 9341

Lore Croker, Administration and Information Assistant, [lore@spc.int](mailto:lore@spc.int) or +679 337 9255

### Useful links:

<http://gmni.imo.org/>

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### About SPC:

The Pacific Community (SPC) is the principal scientific and technical organisation in the Pacific. Established in 1947, it gathers 26 Member Countries and Territories and works for the development and advancement of the Pacific peoples. For more information, please visit our website on [www.spc.int](http://www.spc.int).

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**From:** Lore Croker  
**To:** "sdm-info@bulletin@lists.spc.int"  
**Subject:** FW: [SPC-News] Practising maritime safety and energy efficiency in Kiribati  
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SPC's Ship Safety Audit Adviser, Capt. Omirete Tabureka, reiterated the need for the ship operators to adopt the Safe Operations Plan (SOP) integrated with the Ship Energy Efficiency Management Plan (SEEMP) for safe and efficient sea transportation in saying that "sea transportation is essential for the livelihood of the people living on the outer islands and the ship owners and captains have to take charge to provide a reliable, safe and energy efficient service."

MTCC-Pacific is part of the Global MTCC Network (GMN), a project implemented by the International Maritime Organization (IMO), and funded by the European Union, to build the capacity of developing countries for climate mitigation in the maritime industry and thereby contributing to Kiribati's Nationally Determined Contributions (NDC) and broader Sustainable Development Goals.

During the next week, MTCC-Pacific will follow in the footsteps of the PIDSS program and together work with ships under the PIDSS program to develop safe (SOP) and efficient (SEEMP) shipping. This is critical to ensure that ships are operating safely by adopting the best available and appropriate safe management practices and thereby make it easier to adopt complementary energy efficient operations.

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### Useful links:

<http://gmn.imo.org/>  
<http://www.spc.int/>  
<http://mtccpacific.spc.int/>  
<http://micttd.gov.ki/>

### About SPC:

The Pacific Community (SPC) is the principal scientific and technical organisation in the Pacific. Established in 1947, it gathers 26 Member Countries and Territories and works for the development and advancement of the Pacific peoples. For more information, please visit our website on [www.spc.int](http://www.spc.int).

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