

**Report of the 2013 Concentrated Inspection Campaign  
(CIC) on PROPULSION AND AUXILIARY MACHINERY**



November, 2014

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## Executive Summary

The Tokyo MOU on Port State Control (TMOU) carried out a joint Concentrated Inspection Campaign (CIC) on Propulsion and Auxiliary Machinery between September 1 and November 30 2013 with the Paris MOU on Port State Control (PMOU). The Viña del Mar Agreement, the Indian Ocean MOU, the Mediterranean MOU and the Black Sea MOU also took part in this Concentrate Campaign. During the campaign, 17 TMOU and 27 PMOU member states focused on compliance with SOLAS Chapter II-1 requirements on inspected ships. This report documents the results of the campaign for the TMOU Maritime Authorities. Results for the Paris MOU Maritime Authorities are documented separately and paragraph 3.2 shows a comparison of the CIC results with the Paris MOU.

The objective of the CIC was to provide indications as to the industry's level of compliance with specific aspects of SOLAS Chapter II-1. Deficiencies related to propulsion and auxiliary machinery have traditionally been one of the top six categories of deficiencies recorded during the PSC inspections in previous years. An average of 7% of the total number of the deficiencies identified within the TMOU region is related to machinery installations in the past three years.

During the CIC, Port State Control Officers (PSCO's) were requested to verify critical areas for the propulsion and auxiliary machinery installations, some of which are related to documentation, main and auxiliary equipment, crew familiarization and operational controls.

A total of 8,510 inspections were carried out during the CIC involving 7,588 individual ships. Of these, 6,367 inspections were conducted with a CIC questionnaire (74.8%). The overall detention rate for inspections conducted with a questionnaire was 2.9% (189 ships were detained). The CIC-topic detention rate was 0.7% (45 ships were detained). 23.8% of the detentions were CIC-topic related.

Considering both the questionnaire and deficiency data, the most positive results were reported for Question 9, which asked whether the bilge pumping arrangements appear to be in good working order. The least favourable results were reported for Question 4, which asked if the protective arrangements for machinery were in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards, and Question 8, which asked if the emergency sources of power and emergency lighting appear to be working satisfactory.

Heavy load ships had the highest CIC-topic related detention rate (3.2%), followed by Refrigerated cargo ships (2.4%) and ships for other special activities (1.3%). A number of ship types had "zero" CIC-topic related detentions. Older ships (> 35 years) had the lowest detention rate (0%) but ships from 24 to 29 years had the highest detention rate (1.5%). Be note numbers of ships inspected over 35 years were only 59, and could be the reason they had the lowest detention rate.

Ships from 85 flag states were inspected during the CIC. The flag state with the highest detention rate (CIC-topic related) was Comoros (100%, one ship inspected and one ship detained). 63 of the 85 flag states (74%) did not have any detentions. The overall results of ship detentions was consistent with the risk profiling methodology of the TMOU – very high risk ships comprised (by far) the largest percentage of ships detained per inspection.

Of the TMOU member states, China by far conducted the most inspections (1,983), followed by Japan (1,735), Australia (899) and Korea, Republic of (691). The least number of inspections were conducted by Marshall Islands (1) followed by Fiji (4).

The TMOU concludes that the CIC has indeed provided sound evidence supporting that the industry has in general achieved a satisfactory level of compliance with the specific provisions of SOLAS Chapter II-1 pertaining to propulsion and auxiliary machinery. Although the overall results of the CIC are generally satisfactory, given the fact that 23,8% of the detentions were CIC-topic

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related during the campaign period, the results highlight that propulsion and auxiliary machinery installations on board remain a challenge to keep under control.

Key recommendations pertain to the TMOU continuing, during normal PSC inspections, to put emphasis on the Chapter II-1 requirements that had the least favourable results of the CIC, and continuing to reduce the inconsistencies between the questionnaire and deficiency data by emphasizing the importance of using only one code for each question and properly completing CIC documentation during training sessions.

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# Introduction

## 1.1 Purpose of this Report

This report documents the results of the Concentrated Inspection Campaign (CIC) on Propulsion and Auxiliary Machinery (focused on SOLAS CH II-1) which was carried out by 17 member Maritime Authorities of the Tokyo Memoranda of Understanding (MOU) on Port State Control between September 1 and November 30, 2013. The CIC was carried out jointly by the Paris MOU on Port State Control which involved 27 additional Maritime Authorities (44 in total). CIC results for the Paris MOU are documented in a separate report and paragraph 3.2 shows a comparison of the CIC results with the Paris MOU.

The Viña del Mar Agreement, the Indian Ocean MOU, the Mediterranean MOU and the Black Sea MOU also took part in this Concentrate Campaign

## 1.2 Objective of the CIC

Chapter II-1: Construction-Structure, Subdivision and Stability, Machinery and Electrical installations of SOLAS 74 with its amendments applies to all ships, irrespective of type. New and Existing vessels should comply with the requirements of the Convention as appropriate.

All Flag States should ensure vessels comply with the requirements of Ch II-1 as amended.

The objective of the campaign on Propulsion and Auxiliary Machinery was to get a detailed view of the compliance of the relevant regulations.

The deficiencies related to propulsion and machinery installations in the past three years account for 7% of total deficiencies within the Tokyo and Paris MOU and a CIC on the propulsion and auxiliary machinery has never been done. Deficiencies related to propulsion and auxiliary machinery have traditionally been one of the top six categories of deficiencies recorded during the PSC inspections in previous years.

## 1.3 Scope of the CIC

The scope of the CIC was the safety and condition of propulsion and auxiliary machinery, especially the working order and maintenance of the main engine, auxiliary engines, auxiliary equipment and their related alarm system.

Special attention was given to familiarity of the crew with safety and emergency procedures with regard to main engine, auxiliary engines and auxiliary equipment.

CIC targeted 11 aspects of compliance provisions that are considered important for operation of propulsion and auxiliary machinery. Areas include:

- Compliance with the requirements of the SOLAS convention for propulsion and auxiliary machinery;
- Ensuring all officers or crew members in charge of operation of propulsion and auxiliary machinery have received proper training in carrying out their duties.; and,
- Ensuring the awareness among engine crew on propulsion and auxiliary machinery related issues.

The CIC was designed to examine specific areas and not intended to detract from the normal coverage of Port State Control Inspections. As such, it was conducted in conjunction with the regular Port State Control targeting and inspection activities.

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Member Maritime Authorities were provided with a standardized questionnaire format to record and report their results against the 11 targeted compliance provisions that comprised the CIC. In addition, Port State Control Officers (PSCOs) were required to indicate if the ship was detained as a result of the CIC. The questionnaire required a "Yes" (Satisfactory) or "No" (Unsatisfactory) response to each question. In some cases a "N/A" (Not Applicable) answer was acceptable. For each "No" answer, participants were directed to document the deficiency using the appropriate deficiency code on Form B of the PSC inspection report. A "No" answer was serious enough that the ship could be considered for detention but in this case PSCO should use his/her judgment to determine whether the vessel should be considered for detention.

## 1.4 General Remarks

General remarks pertaining to this report include:

- For the purpose of this report, a detention is an inspection containing at least one deficiency that is considered a ground for detention.
- Except for Table 2, the tables contained in this report take into account the total number of inspections conducted during the CIC - those conducted with a CIC questionnaire and those conducted without. As such, the detention rates that comprise the analysis relate to the total number of inspections, not just those that were conducted with a CIC questionnaire.

## Summary, Conclusions and Recommendations

### 2.1 Summary

The following summarizes the results of the CIC:

- 7,588 individual ships and a total of 8,510 inspections were conducted during the CIC. Of these, 6,367 inspections were conducted with a CIC questionnaire (74.8%).
- Of the ship inspections conducted with a CIC questionnaire, 189 ships were detained of which 45 or 23.8% were CIC-topic related. The overall detention rate of ships inspected with a CIC questionnaire (percentage of detentions per inspection) was 2.9%. The CIC-topic related detention rate was 0.7%.
- Responses to Question 9, which asked do the bilge pumping arrangements appear to be in good working order, reported the most favorable results of all questions, considering that only 86 unsatisfactory responses were recorded representing 1.3% of inspections.
- The least favorable results (Response "NO") were reported for Question 4, which asked if the protective arrangements for machinery were in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards, considering that 501 unsatisfactory responses were recorded representing 7.8% of inspections. The second least favorable results were reported for Question 8 which asked if the emergency sources of power and emergency lighting appear to be working satisfactory, considering that 413 unsatisfactory responses were recorded representing 6.5% of inspections.
- Deficiency 04103 (related to Question 8), which pertains to the emergency sources of power and emergency lighting appear to be working satisfactory, accounted for the most number of reported inspection deficiencies at 25.4% of the total. This was closely followed by Deficiency 13107 (related to Question 7), pertaining to the main and auxiliary boilers and boiler feed systems appear to be in safe working order which accounted for 17.3% of the total reported deficiencies. Deficiency 01303 (related to Question 2), which pertains to if the ship operates with periodically unattended machinery spaces, had it been provided with documentary evidence of fitness, accounted for the least number of reported inspection deficiencies at

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0.1% of the total .By ship type, Heavy load ships had the highest CIC-topic related detention rate (3.2%), followed by Refrigerated cargo ships (2.4%) and ships for Other special activities (1.3%). A number of ship types had “zero” CIC-topic related detentions.

- By ship age, older ships (>35 years) had the lowest detention rate (0%) but ships from 24 to 29 years had the highest detention rate (1.5%). The rate increased steadily from ships less than 11 years old to ships over 30-35 years old.
- The vast majority of the ships inspected were only inspected once (91.7%). Of the remaining ships, 7.7% were inspected twice and 0,6% three times.
- With respect to CIC-topic related detentions, the flag state with the highest percentage of ships detained was Comoros (100%, one ship inspected and one ship detained). This was followed by Niue and Spain and (both had 50%), Gibraltar (4.8%) and Korea, DPR (3.7%). The remaining flag states were 3.2% and under, and 63 of the 85 flag states (74%) did not have any detentions.
- By ship per Target Factor, the CIC results are consistent with what would be expected in accordance with the risk profiling breakdown. This helps support the validity of the risk profiling methodology used by the TMOU. For general detentions and CIC-topic related detentions, ships considered very high risk comprised (by far) the largest percentage of ships detained per inspection. High risk ships accounted for the second most detained ships, followed by medium and low risk ships.
- There were a total of 7,793 inspections of ships where the certificate was recorded as issued by the RO. Only one (1) CIC-topic related detentions was recorded that had a deficiency linked to one of the three certificates. This equates to a very low detention rate of only 0.01%. By comparison, the detention rate for the overall CIC (CIC-topic related deficiencies) was 2.9% which means that ships for which RO’s have the delegated authority to perform inspections and certifications on behalf of the member Maritime Authority performed significantly better than the broader CIC results.
- Of the TMOU member states, China by far conducted the most inspections (1,983), followed by Japan (1,735), Australia (899), Korea, Republic of (691). The least number of inspections were conducted by Marshall Island (1) followed by Fiji (4). With respect to CIC-topic related detentions, Hong Kong detained the highest percentage of ships at a rate of 4.5%, followed by New Zealand at 1.8%. Two member states detained 1.3 % of ships, one member state detained 0.6 % of ships, one member state detained 0.4 % of ships, two members state detained 0.3 % of ships, one member state detained 0.2 % of ships, one state member detained 0.1 % of ships. Eight member states did not detain any vessels for CIC-related deficiencies.

## 2.2 Conclusions

The objective of the CIC was to provide indications as to the industry’s level of compliance with specific aspects of SOLAS Chapter II-1 specifically on Propulsion and Auxiliary Machinery. It was also the intent of the CIC to help raise awareness of propulsion and auxiliary machinery issues.

During the campaign, 23.8% of the detentions were CIC-topic related.

Given the results of the CIC detention rates (CIC-topic related) , the TMOU concludes that the CIC has indeed provided sound evidence supporting that the industry has in general achieved a satisfactory level of compliance with the specific provisions of SOLAS Chapter II-1 pertaining to propulsion and Auxiliary Machinery. In addition, every vessel that was inspected received the benefit of enhanced awareness of propulsion and auxiliary related issues. Nonetheless, the fact that 23.8% of the detentions during the campaign were CIC-topic related and specific areas covered by the CIC that did not perform within acceptable standards, the results highlight that

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propulsion and auxiliary machinery installations on board remain a challenge to keep under control.

The results of the inspections indicate that those specific areas to keep under control deals mainly with areas related to personal protection (protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards) and emergency systems (emergency sources of power and emergency lighting working properly).

## **2.3 Recommendations**

The following recommendations emerge after this CIC 2013 on Propulsion and Auxiliary Machinery:

1. The TMOU continue, during normal PSC inspections, to put emphasis on the specific areas covered by the CIC that had the least favorable results, mainly with areas related to personal protection (protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards) and emergency systems (emergency sources of power and emergency lighting working properly).
2. At the same time it is also recommended to consider in future training courses and seminars of PSCO's and Ship Companies to include the requirements related to propulsion and auxiliary machinery, focusing and emphasizing the aspects of personal protection and emergency systems to minimize danger of persons on board.
3. It's highly recommended to continue the execution of an annual CIC, mostly considering which are the most important deficiencies recorded during the PSC inspections in previous years.

## **CIC Questionnaire Results**

### **3.1 Analysis**

#### **3.1.1 Response to CIC questionnaire**

(Table 1)



Table 1 Response to CIC questionnaire

		'YES'		'NO'		N/A		Blank		Total # of inspections	% 'NO' of total # of inspections	% 'NO' adjusted
		#	%	#	%	#	%	#	%			
Q1	Are instructions and manuals for ship machinery essential to safe operation, written in a language understood by the ship`s personnel?	6110	96,0%	257	4,0%					6367	4,0%	3,8%
Q2	If the ship operates with periodically unattended machinery spaces, has it been provided with documentary evidence of fitness?	3138	97,2%	90	2,8%	3139	49,3%			6367	1,4%	1,4%
Q3	Do the Oil Mist Detectors or any other automatic shut-off arrangements for the main engine and auxiliary engines appear to be working satisfactory?	5418	98,1%	107	1,9%	842	13,2%			6367	1,7%	1,5%
Q4	Are protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards?	5866	92,1%	501	7,9%					6367	7,9%	7,6%
Q5	Does propulsion machinery and essential auxiliaries appear to be in operational condition?	6168	96,9%	199	3,1%					6367	3,1%	2,9%
Q6	Is cleanliness of the Engine Room, including bilges satisfactory?	6010	94,4%	357	5,6%					6367	5,6%	5,2%
Q7	Do the Main or Auxiliary Boilers and Boiler Feed Systems appear to be in safe working order?	5746	97,3%	159	2,7%	462	7,3%			6367	2,5%	2,4%
Q8	Do the emergency sources of power and emergency lighting appear to be working satisfactory?	5954	93,5%	413	6,5%					6367	6,5%	6,0%
Q9	Do the bilge pumping arrangements appear to be in good working order?	6281	98,6%	86	1,4%					6367	1,4%	1,2%

		'YES'		'NO'		N/A		Blank		Total # of inspections	% 'NO' of total # of inspections	% 'NO' adjusted
		#	%	#	%	#	%	#	%			
<b>Q10</b>	Where an emergency steering drill was witnessed, was it found to be satisfactory?	3439	97,1%	104	2,9%	2824	44,4%			6367	1,6%	1,5%
<b>Q11</b>	Where an emergency operational drill to main engine was witnessed, was it found to be satisfactory?	2161	94,7%	122	5,3%	4084	64,1%			6367	1,9%	1,8%
<b>Q12</b>	Has the ship been detained as a result of this CIC?	72	1,1%	6295	98,9%					6367	98,9%	

\* 'NO' means: the ship may be considered for detention. The details of any detention should be appropriately entered on the PSC report B.

\*\* "[% 'NO' adjusted]" = % "[Answer = NO, may be considered for detention]" but the ship has not been detained.

### 3.1.2. Analysis of answers to questionnaire

Table 1 above reveals that during the period of the CIC, a total of 6,367 inspections were carried out using the CIC questionnaire. The number of unsatisfactory responses per question ranges from 86 to 501 representing from 1.35% to 7.8% of total inspections respectively.

Responses to Question 9, which asked do the bilge pumping arrangements appear to be in good working order, reported the most favourable results of all questions – only 86 unsatisfactory responses were recorded representing 1.35% of inspections. Question 2, Is the ship operates with periodically unattended machinery spaces, had it been provided with documentary evidence of fitness, reported the next most favourable results with only 90 unsatisfactory responses representing 1.41 % of inspections.

The least favourable results were reported for Question 4, which asked if the protective arrangements for machinery were in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards – 501 unsatisfactory responses were recorded representing 7.86% of inspections. An unsatisfactory response to Question 4 was a potentially detainable violation.

Question 8, which asked if the emergency sources of power appear to be working satisfactory, reported the next least favourable results with 413 unsatisfactory responses representing 6.48% of inspections. Question 6 reported 357 unsatisfactory responses (5.6% of inspections) and Question 1 reported 257 unsatisfactory responses (4.03% of inspections).

Chart 1 below summarizes the CIC questionnaire results in order starting with the least favourable question response.

Chart 1: CIC Questionnaire Results in Order Starting with the Least Favourable Question Response

Q N°	Column A Total N° Inspections	Column B Total N° "NO"	Column C Total N° "YES"	Column D Total N° "N/A"	Column F % NO of Total N° of inspections
<b>Q4</b>	<b>6367</b>	<b>501</b>	<b>5866</b>	<b>0</b>	<b>7.86%</b>
<b>Q8</b>	<b>6367</b>	<b>413</b>	<b>5954</b>	<b>0</b>	<b>6.48%</b>
<b>Q6</b>	<b>6367</b>	<b>357</b>	<b>6010</b>	<b>0</b>	<b>5.6%</b>
<b>Q1</b>	<b>6367</b>	<b>257</b>	<b>6110</b>	<b>0</b>	<b>4.03%</b>
<b>Q5</b>	<b>6367</b>	<b>199</b>	<b>6168</b>	<b>0</b>	<b>3.12%</b>
<b>Q7</b>	<b>6367</b>	<b>159</b>	<b>5746</b>	<b>462</b>	<b>2.49%</b>
<b>Q11</b>	<b>6367</b>	<b>122</b>	<b>2161</b>	<b>4084</b>	<b>1.91%</b>
<b>Q3</b>	<b>6367</b>	<b>107</b>	<b>5418</b>	<b>842</b>	<b>1.68%</b>
<b>Q10</b>	<b>6367</b>	<b>104</b>	<b>3439</b>	<b>2824</b>	<b>1.63%</b>
<b>Q2</b>	<b>6367</b>	<b>90</b>	<b>3138</b>	<b>3139</b>	<b>1.41%</b>
<b>Q9</b>	<b>6367</b>	<b>86</b>	<b>6281</b>	<b>0</b>	<b>1.35%</b>

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### 3.1.3. Number of inspections and number of ships in CIC

(Table 2)

	Individual ships inspected during CIC	Inspections performed with a CIC questionnaire	Inspections without a CIC questionnaire
<b>Inspections</b>	7588	6367	2143
<b>Inspections with detentions</b>	282	189	93
<b>Detentions with <i>CIC-topic</i> related deficiencies</b>	60	45	15

Table 2 reveals that a total of 8,510 inspections were conducted during the CIC, of which the vast majority were performed with the CIC questionnaire (6367 or 74.8%). A total of 282 ships were detained. Of the ships were inspected with a CIC questionnaire, a total of 189 were detained of which 45 were related to CIC-topic deficiencies.

CIC-topic related deficiencies therefore accounted for 23.8% of the total ships detained which were inspected with a CIC questionnaire. The detention rate for CIC-topic related deficiencies was 0.7%.

Please note that although it was the intent of the questionnaire at Question 12 to respond "YES" only to those inspections that resulted in detentions due to CIC-topic related deficiencies, PSCO's instead recorded the number of detentions of ships for which inspections were performed using a CIC questionnaire (189 detentions), which included both CIC-topic and non-CIC-topic related detentions. Based on the Form B/Notice of Detention for the Master paperwork, the actual number of vessels that were detained for CIC-topic related deficiencies was 45 and that is the number used throughout this report.

### 3.1.4 Specification of CIC-topic related deficiencies

(Table 3)

Table 3 Specification of CIC-topic related deficiencies

CIC-topic related deficiencies		Inspections	Detentions CIC-topic related	Detentions CIC- topic related with RO responsibility
		(# of inspections with this deficiency) One inspection can have multiple deficiencies	(# of inspections with this deficiency recorded as ground for detention)	(# of inspections with this deficiency recorded as ground for detention and RO related)
10136	Are instructions and manuals for ship machinery essential to safe operation, written in a language understood by the ship's personnel?	199	1	0
01303	If the ship operates with periodically unattended machinery spaces, has it been provided with documentary evidence of fitness?	2	0	0
13101	Do the Oil Mist Detectors or any other automatic shut-off arrangements for the main engine and auxiliary engines appear to be working satisfactory?	262	12	10
13102		265	3	2
09233	Are protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards?	242	0	0
02108		278	1	0
13101	Does propulsion machinery and essential auxiliaries appear to be in operational condition?	262	12	10
13102		265	3	2
09232	Is cleanliness of the Engine Room, including bilges satisfactory?	276	13	5
08109	Do the Main or Auxiliary Boilers and Boiler Feed Systems	45	1	0

CIC-topic related deficiencies		Inspections	Detentions CIC-topic related	Detentions CIC- topic related with RO responsibility
		(# of inspections with this deficiency) One inspection can have multiple deficiencies	(# of inspections with this deficiency recorded as ground for detention)	(# of inspections with this deficiency recorded as ground for detention and RO related)
13107	appear to be in safe working order?	319	2	1
04114	Do the emergency sources of power and emergency lighting appear to be working satisfactory?	144	14	10
04103		468	6	5
13104	Do the bilge pumping arrangements appear to be in good working order?	58	0	0
02105	Where an emergency steering drill was witnessed, was it found to be satisfactory?	181	1	0
13101	Where an emergency operational drill to main engine was witnessed, was it found to be satisfactory?	262	12	10
13108		112	2	1
TOTAL		1842	45	27

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### 3.1.5. Analysis of CIC-topic related deficiencies

Deficiency 04103 (related to Question 8), which pertains to the emergency lighting, accounted for the most number of reported inspection deficiencies at 25.4% of the total. This was closely followed by Deficiency 13107 (related to Question 7), pertaining to the main or auxiliary boilers and boiler feed system which accounted for 17.3% of the total reported deficiencies, and Deficiency 02108 (related to Question 4), pertaining to minimize danger to persons with regards to electrical shock and other hazards, which accounted for 15.09%.

Deficiency 01303 (related to Question 2), which pertains to unattended machinery spaces evidence, accounted for the least number of reported inspection deficiencies at 0.11% of the total. Deficiency 08109 (related to question 7) pertaining to main and auxiliary boilers and boiler feed systems, and Deficiency 13104 (bilge pump arrangements) accounted for the next least number of reported inspection deficiencies.

Be note, this analysis reveals that deficiency 13107 pertaining to Question 7 was the second most accounted number of reported inspection deficiencies and deficiency 08109 pertaining to the same Question 7 accounted the second least number of reported inspection deficiencies. Due to Tokyo MOU Manual have only one Code for Boilers (Code 08109 –Boiler Alarm) was necessary to include in Questionnaire a second code of reference (Code 13107). Therefore the different result for Question 7.

Also, this analysis reveals there are some inconsistencies between the deficiency results and the questionnaire results which raise some questions. For example, Deficiency 04103 which pertains to Question 8 was the most used deficiency code, yet according to the questionnaire results Question 8 reported the second most favorable results of all questions.

Another example pertains to Deficiency 13107, which is the code for non-compliance with Question 7. According to the deficiency results, Deficiency 13107 is the second most used code, yet according to the questionnaire results Question 7 reported the sixth most favorable results of all questions.

The CIC instructions require that for each unsatisfactory answer in the questionnaire, PSCO's are to provide the detail of any deficiencies on the PSC Form B. The questionnaire also specifically notes for each question, the deficiencies that apply. It is thus reasonable to expect that there should be good correlation between the results of the questionnaire and the results of the deficiencies in terms of most favorable to least favorable.

The inconsistencies that exist between the questionnaire data and the deficiency data are found in every CIC. One explanation may be that in some instances PSCO's are completing the questionnaire but are not doing the extra step for the unsatisfactory answers and filling out the PSC Report Form B. Another explanation may be that given that the CIC is carried out in conjunction with the normal PSC inspections, perhaps in some cases PSCO's are filling out the questionnaire independent of the PSC Report Form B. It could also be a combination of both explanations.

The above explanations support that both the questionnaire and the deficiency data are likely correct but just not necessarily associated with each other in all cases. For this reason, it is the opinion of the TMOU that even though the deficiency and questionnaire data is not necessarily consistent, it does not diminish the validity of the overall results of the CIC. Independently and/or taken together, both results provide valuable information to TMOU Maritime Authorities as to the industry's level of compliance with specific aspects of SOLAS Chapter II-1 on Construction-Structure, Subdivision and Stability, Machinery and Electrical Installations on board ships.

### 3.1.6. Number of ships to number of inspections during CIC campaign

(Table 4)

Table 4 Number of ships to number of inspections during CIC campaign

# of inspections performed per ship	# of ships	% of total
1	6961	91,7%
2	585	7,7%
3	42	0,6%
TOTAL	7588	

\*It is noted that the total number of individual ships in Table 4, 6, 7 and Annex 1.2 is not a sum total of the column, as the approach to individual ship calculation is not summing, but regional identification calculations.

Table 4 reveals that the vast majority of the ships inspected during the CIC (91.7%) were only inspected once. Of the remaining ships, 7.7% were inspected twice, 0.6% three times.

### 3.1.7 Number of inspected ships per Target Factor

(Table 5)

Table 5 Number of inspected ships per Ship Risk Profile

Target Factor	# of inspections	# of detentions	detention as % of inspections	detentions CIC-topic related	detentions CIC-topic related as % of inspections
Low	2595	33	1%	4	0,2%
Medium	3503	95	3%	16	0,5%
High	2030	128	6%	20	1,0%
Very high	129	26	20%	5	3,9%
<b>TOTAL</b>	8257	282		45	

The CIC results shown in Table 5 above, which identify the number and percentage of ship detentions falling in each of the ship risk profile categories, are consistent with what would be expected in accordance with the risk profiling breakdown. This helps support the validity of the risk profiling methodology used by the TMOU in 2013. For general detentions and CIC-topic related detentions, ships considered very high risk comprised (by far) the largest percentage of ships detained per inspection. High risk ships accounted for the second most detained ships, followed by medium and low risk ships.



### 3.1.8 Number of inspected ships and detentions per ship type

(Table 6)

Table 6 Number of inspected ships and detentions per ship type

Ship type	# of individual ships	# of CIC inspections	# of inspections	# of detentions	detention as % of inspections	detentions CIC-topic related	detentions CIC-topic related as % of inspections
Bulk carrier	2683	2166	2885	89	3%	11	0,4%
Chemical tanker	517	401	557	8	1%	1	0,2%
Combination carrier	8	7	8	0	0%	0	0,0%
Container	1181	1047	1218	23	2%	8	0,7%
Gas carrier	161	124	166	5	3%	0	0,0%
General cargo/multipurpose	1664	1468	1950	108	6%	16	0,8%
Heavy load	31	28	31	2	6%	1	3,2%
High speed passenger craft	6	0	6	0	0%	0	0,0%
Livestock carrier	14	11	15	2	13%	0	0,0%
NLS tanker	11	8	12	0	0%	0	0,0%
Offshore supply	40	24	40	1	3%	0	0,0%
Oil tanker	488	374	520	9	2%	1	0,2%
Other special activities	74	54	76	7	9%	1	1,3%
Passenger ship	53	35	56	1	2%	0	0,0%
Refrigerated cargo	201	188	211	10	5%	5	2,4%
Ro-Ro cargo	59	55	63	4	6%	0	0,0%
Ro-Ro passenger ship	20	17	24	2	8%	0	0,0%
Special purpose ship	16	11	16	2	13%	0	0,0%
Tugboat	72	54	76	4	5%	0	0,0%
Vehicle carrier	237	231	251	4	2%	1	0,4%
Woodchip carrier	69	64	76	1	1%	0	0,0%
<b>TOTAL</b>	<b>7588</b>	<b>6367</b>	<b>8257</b>	<b>282</b>		<b>45</b>	

\* It is noted that the total number of individual ships in Table 4, 6, 7 and Annex 1.2 is not a sum total of the column, as the approach to individual ship calculation is not summing, but regional identification calculations.

Table 6 reports the number of ship inspections and the number and percentage of ships detained during the CIC by ship type. With respect to CIC-topic related detentions, Heavy load ships had the highest detention rate (3.2%), followed by Refrigerated cargo ships (2.4%), and Other special activities 1.3%. A number of ship types had "zero" CIC-topic related detentions including combination carriers, gas carrier, high speed passenger crafts, livestock carriers, NLS tankers,

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offshore supply, passenger ships, Ro-Ro cargo, Ro-Ro passenger ship, special purpose ships, tugs and woodchip carriers.

It is important to note that the sample sizes (number of ships inspected) of the top two ship types detained (Heavy load ships and Refrigerated cargo ships) were very low , as well as compared to several other ship types including bulk carriers, container ships, general cargo/multipurpose. There were only 31 inspections of Heavy load ships compared to 2,683 Bulk carriers, 1,664 General cargo /multipurpose ships, 1,181 Container ships and 517 Chemical tankers inspections. The detention rate for Bulk carriers was 0.4%, General cargo/multipurpose was 0.8%, Container ships 0.7%, and Chemical tankers was 0.2%

Although smaller sample sizes do not invalidate the results in anyway, it does however provide less certainty as to how widespread a finding may be within a specific ship type. If available, comparing the data in Table 6 with the total number of ships that comprise the overall convention ship fleet by ship type would help improve this uncertainty and bring more precision to the analysis.

If only vessel types with a relatively larger sample size are considered in the analysis, general cargo/multipurpose ships become the ship type with the highest percentage of detentions followed by container ships and bulk carriers .

### **3.1.9 Inspections and detentions per Flag State**

(See Annex 1.2)

The table in Annex 1.2 presents the number of inspections and number and percentage of ships detained during the CIC by flag state. Ships from 85 different flag states were inspected during the CIC.

With respect to CIC-topic related detentions, the flag state with the highest percentage of ships detained was Comoros (100%). This was followed by Niue and Spain and (both had 50%), Gibraltar (4.8%) and Korea, DPR (3.7%). The remaining flag states were 3.2% and under, and 63 of the 85 flag states (74%) did not have any detentions.

The flag states with the highest percentage of ships detained had relatively smaller sample sizes (number of ships inspected) compared to other flag states. Again, as mentioned previously, smaller sample sizes do not make the results any less valid but rather reduces the certainty as to how widespread a finding may be, in this case, for a particular flag state. If available, including the number of ships that comprise each flags convention fleet in the Annex 1.2 table would help improve this uncertainty and bring more precision to the results.

### 3.1.10 Inspections and detentions per Recognized Organization

(See Annex 1.3)

The table in Annex 1.3 presents the number of inspections (by vessel certificate – 502, 504 and 513) and number of CIC-topic related detentions by Recognized Organization (RO). It shows there were a total of 7,793 inspections of ships where the certificate was recorded as issued by the RO and only one (1) CIC-topic related detentions which had a deficiency linked to one of the three certificates. This equates to a very low detention rate of only 0.01%.

By comparison, the detention rate for the overall CIC (CIC-topic related deficiencies) was 0.7% which means that ships for which RO's have the delegated authority to perform inspections and certifications on behalf of the member Maritime Authority performed significantly better than the broader CIC results.

The RO with the detention was Germanisher Lloyd (1).

Nippon Kaiji Kyokai ships also had by far the largest number of inspections (2,394) comprising 30.7% of RO ships inspected.

### 3.1.11 Ship age overview

(Table 7)

Table 7 ship age overview

Ship age	# of individual ships	# of CIC inspections	# of inspections	# of detentions	Detention as a % of inspections	Detentions CIC-topic related	Detentions CIC-topic related as a % of inspections
< 6 Years	2591	2128	2768	58	2%	7	0,3%
6-11 Years	2173	1875	2353	79	3%	19	0,8%
12-17 Years	1156	966	1251	35	3%	3	0,2%
18-23 Years	844	708	927	38	4%	3	0,3%
24-29 Years	559	468	663	50	8%	10	1,5%
30-35 Years	210	170	229	20	9%	3	1,3%
>35 Years	59	52	66	2	3%	0	0,0%
<b>TOTAL</b>	<b>7588</b>	<b>6367</b>	<b>8257</b>	<b>282</b>		<b>45</b>	

\* It is noted that the total number of individual ships in Table 4, 6, 7 and Annex 1.2. is not a sum total of the column, as the approach to individual ship calculation is not summing, but regional identification calculations.

Table 7 reports the number of ship inspections and the number and percentage of ships detained during the CIC by ship age. By ship age, the data indicates that the rate of ship detention per inspection does not increase with ship age. For ships 12-17 years old the rate of detention was 0.2% , followed by ships less than 6 years and also by ships 18-23 years old with 0.3%.

## 3.2 Comparison Results of CIC with Paris MOU

Table 8 Comparison Results with Paris MOU

	PMOU	TMOU
# of inspections with CIC Questionnaire	3879	6367
# of detentions	166	189
Detentions as a % of inspections	4.3%	2.9%
Detentions with CIC-topic related deficiencies	68	45
Detentions with CIC-topic related deficiencies as a % of inspections	1.8%	0.7%
Detentions with CIC-topic related deficiencies as a % of detentions	41%	23.8%
CIC Question reporting the most favourable results	Q9	Q9
CIC Question reporting the least favourable results	Q6	Q4
Ship type reporting the least favourable results	Refrigerated cargo ships	Heavy load ships
Ship age reporting the most favourable results	< 5 years	>35 years
Ship age reporting the least favourable results	21-25 years	24-29 years
RO ships detention rate for CIC-topic related detentions	0.2%	0.01%
# of RO responsibility ship inspections during CIC	3423	7793

# Annex 1 CIC Questionnaire

## Annex 1.1 Inspection form of the CIC

MEMORANDUM OF UNDERSTANDING  
ON PORT STATE CONTROL  
IN THE ASIA-PACIFIC REGION



CONCENTRATED INSPECTION CAMPAIGN  
ON PROPULSION AND AUXILIARY MACHINERY  
01/09/2013 to 30/11/2013

### CIC ON PROPULSION AND AUXILIARY MACHINERY

Inspection Authority			
Ship Name		IMO Number	
Date of Inspection		Inspection Port	

No.	QUESTION	Yes	No	N/A
<b>DOCUMENTATION</b>				
1	Are instructions and manuals for ship machinery essential to safe operation, written in a language understood by the ship's personnel? <b>(Code 10136).</b>	<input type="checkbox"/>	<input type="checkbox"/>	
2	If the ship operates with periodically unattended machinery spaces, has it been provided with documentary evidence of fitness? <b>(Code 01303).</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>MAIN ENGINE AND AUXILIARY ENGINES</b>				
3	Do the Oil Mist Detectors or any other automatic shut-off arrangements for the main engine and auxiliary engines appear to be working satisfactory? <b>(Code 13101, Code 13102)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Are protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards? <b>(Code 09233, Code 02108)</b>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Does propulsion machinery and essential auxiliaries appear to be in operational condition? <b>(Code 13101, Code 13102).</b>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Is cleanliness of the Engine Room, including bilges satisfactory? <b>(Code 09232).</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>AUXILIARY MACHINERY</b>				
7	Do the Main or Auxiliary Boilers and Boiler Feed Systems appear to be in safe working order? <b>(Code 08109, Code 13107).</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Do the emergency sources of power and emergency lighting appear to be working satisfactory? <b>(Code 04114, Code 04103)</b>	<input type="checkbox"/>	<input type="checkbox"/>	
9	Do the bilge pumping arrangements appear to be in good working order? <b>(Code 13104).</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>OPERATIONAL CONTROLS</b>				
10	Where an emergency steering drill was witnessed, was it found to be satisfactory? <b>(Code 02105)</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Where an emergency operational drill to main engine was witnessed, was it found to be satisfactory? <b>(Code 13101, Code 13108).</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Has the ship been detained as a result of this CIC?	<input type="checkbox"/>	<input type="checkbox"/>	

**Notes:**

The detail of any deficiencies should be appropriately entered on the PSC Report of Inspection Form B and include the deficiency code as indicated in the question.

For questions combined with the conjunction "and", if the box "YES" is marked, means all the parts in the question are in compliance. If any part of the question is not as required, the box should be marked "NO".

## Annex 1.2 Inspections and Detentions per Flag State

Table Annex 1.2 Inspections and detentions per Flag State

Flag	# of individual ships	# of CIC inspections	# of inspections	# of detentions	Detention as a % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as a % of inspections
Antigua and Barbuda	124	103	124	3	2%	1	0,8%
Australia	1	0	1	0	0%	0	0,0%
Bahamas	166	148	173	6	3%	0	0,0%
Bahrain	1	1	1	0	0%	0	0,0%
Bangladesh	12	10	15	0	0%	0	0,0%
Barbados	4	3	4	0	0%	0	0,0%
Belgium	8	5	8	0	0%	0	0,0%
Belize	90	80	118	9	8%	3	2,5%
Bermuda (GB)	15	13	16	0	0%	0	0,0%
Cambodia	272	242	356	39	11%	6	1,7%
Cayman Islands (GB)	30	26	31	0	0%	0	0,0%
China	234	173	241	2	1%	1	0,4%
Colombia	1	1	1	0	0%	0	0,0%
Comoros	1	1	1	1	100%	1	100,0%
Cook Islands	6	4	8	0	0%	0	0,0%
Croatia	6	4	7	0	0%	0	0,0%
Curacao	5	4	5	0	0%	0	0,0%
Cyprus	128	110	133	3	2%	0	0,0%
Denmark	35	34	36	1	3%	0	0,0%
Dominica	2	2	2	0	0%	0	0,0%
Egypt	4	4	4	2	50%	0	0,0%
Ethiopia	2	1	2	0	0%	0	0,0%
Falkland Islands (GB)	1	1	1	0	0%	0	0,0%
France	8	7	8	0	0%	0	0,0%
Germany	42	40	43	2	5%	0	0,0%
Gibraltar (GB)	21	18	21	1	5%	1	4,8%
Greece	86	70	89	1	1%	0	0,0%
Honduras	1	0	1	0	0%	0	0,0%
Hong Kong, China	763	626	840	6	1%	1	0,1%
India	26	20	31	0	0%	0	0,0%
Indonesia	38	18	42	6	14%	1	2,4%
Iran, Islamic Republic of	10	10	10	1	10%	0	0,0%

Flag	# of individual ships	# of CIC inspections	# of inspections	# of detentions	Detention as a % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as a % of inspections
Isle of Man (GB)	44	38	45	1	2%	0	0,0%
Israel	3	3	3	0	0%	0	0,0%
Italy	32	26	35	0	0%	0	0,0%
Jamaica	1	1	1	0	0%	0	0,0%
Japan	39	32	39	1	3%	0	0,0%
Kiribati	56	44	67	6	9%	1	1,5%
Korea, Democratic People's Republic of	50	37	54	8	15%	2	3,7%
Korea, Republic of	374	330	393	2	1%	0	0,0%
Kuwait	3	3	3	1	33%	0	0,0%
Liberia	542	460	572	26	5%	4	0,7%
Libyan Arab Jamahiriya	1	1	1	0	0%	0	0,0%
Luxembourg	7	6	7	0	0%	0	0,0%
Malaysia	63	51	65	2	3%	0	0,0%
Maldives	1	1	1	0	0%	0	0,0%
Malta	186	146	193	6	3%	2	1,0%
Marshall Islands	410	332	429	7	2%	2	0,5%
Moldova, Republic of	1	0	1	0	0%	0	0,0%
Mongolia	28	16	29	5	17%	0	0,0%
Myanmar	1	1	1	1	100%	0	0,0%
Netherlands	39	32	40	0	0%	0	0,0%
New Zealand	1	0	1	0	0%	0	0,0%
Niue	1	1	2	2	100%	1	50,0%
Norway	68	58	69	2	3%	0	0,0%
Pakistan	1	0	1	0	0%	0	0,0%
Panama	2290	1994	2509	79	3%	10	0,4%
Papua New Guinea	2	2	2	0	0%	0	0,0%
Peru	3	3	3	0	0%	0	0,0%
Philippines	58	49	66	7	11%	1	1,5%
Portugal	2	2	2	0	0%	0	0,0%
Qatar	1	0	1	0	0%	0	0,0%
Russian Federation	80	76	81	5	6%	1	1,2%
Saint Kitts and Nevis	10	8	11	0	0%	0	0,0%
Saint Vincent and the Grenadines	35	30	36	1	3%	0	0,0%
Saudi Arabia	3	3	3	0	0%	0	0,0%

Flag	# of individual ships	# of CIC inspections	# of inspections	# of detentions	Detention as a % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as a % of inspections
Ship registration withdrawn	1	1	1	0	0%	0	0,0%
Sierra Leone	43	36	54	7	13%	1	1,9%
Singapore	563	451	587	2	0%	0	0,0%
Solomon Islands	1	0	1	0	0%	0	0,0%
Spain	2	1	2	1	50%	1	50,0%
Sri Lanka	2	1	2	0	0%	0	0,0%
Sweden	8	8	8	1	13%	0	0,0%
Switzerland	7	6	8	1	13%	0	0,0%
Taiwan, China	21	17	23	0	0%	0	0,0%
Tanzania, United Republic of	8	6	9	3	33%	0	0,0%
Thailand	56	44	64	5	8%	0	0,0%
Togo	8	4	13	2	15%	0	0,0%
Tonga	3	3	4	0	0%	0	0,0%
Turkey	18	10	18	1	6%	0	0,0%
Tuvalu	29	16	31	4	13%	1	3,2%
United Kingdom	57	48	58	1	2%	0	0,0%
United States	14	13	15	0	0%	0	0,0%
Vanuatu	28	23	32	2	6%	1	3,1%
Vietnam	156	114	188	7	4%	2	1,1%
<b>TOTAL</b>	<b>7588</b>	<b>6367</b>	<b>8257</b>	<b>282</b>		<b>45</b>	



## Annex 1.3 Inspections and detentions per Recognized Organization

Table Annex 1.3 Inspections and detentions per Recognized Organization

Issuing authority	Inspection*			Detentions CIC- topic related with RO responsibility**
	502 – Cargo Ship Safety Equipment	504 – Cargo Ship Safety	513 – Passenger Ship Safety	
American Bureau of Shipping	601	2	0	0
Bureau Securitas	1	0	0	0
Bureau Veritas	545	6	4	0
China Classification Society	571	1	6	0
China Corporation Register of Shipping	39	0	0	0
Class withdrawn	1	0	0	0
Cosmos Marine Bureau Inc.	1	0	0	0
Croatian Register of Shipping	8	0	0	0
Det Norske Veritas	488	2	8	0
Germanischer Lloyd	584	8	3	1
Global Marine Bureau Inc.	61	5	0	0
Indian Register of Shipping	10	0	0	0
Intermaritime Certification Services, S.A.	80	0	0	0
International Register of Shipping	41	1	0	0
International Ship Classification	63	0	0	0
Iranian Classification Society	1	0	0	0
Isthmus Bureau of Shipping, S.A.	69	2	0	0
Korea Classification Society	51	7	0	0
Korea Ship Safety Technology Authority	4	0	0	0
Korean Register of Shipping	718	2	17	0
Lloyd's Register	529	12	10	0
Nippon Kaiji Kyokai	2394	9	1	0
Other	45	1	0	0
Overseas Marine Certification Services	43	2	0	0
Panama Maritime Documentation Services	54	0	0	0
Panama Shipping Registrar Inc.	12	0	0	0
Polski Rejestr Statkow (Polish Register of Shipping)	6	0	0	0
PT Biro Klasifikasi Indonesia	1	0	0	0
Registro Internacional Naval, S.A.	2	0	0	0
Registro Italiano Navale	104	0	3	0
Russian Maritime Register of Shipping	99	0	0	0

Issuing authority	Inspection*			Detentions CIC- topic related with RO responsibility**
	502 – Cargo Ship Safety Equipment	504 – Cargo Ship Safety	513 – Passenger Ship Safety	
Ship Classification Of Malaysia	3	0	0	0
Singclass International	9	1	0	0
Sing-Lloyd	13	1	0	0
Union Bureau of Shipping	161	13	0	0
Universal Maritime Bureau Ltd	61	4	0	0
Vietnam Register of Shipping	189	0	0	0
<b>TOTAL</b>	7662	79	52	1

\* Number of inspections where the certificate is recorded as issued by the RO

\*\* Number of inspections where the RO issued the certificate and a deficiency covered by that certificate was recorded as detainable and RO related