

**Report of the 2013 Concentrated Inspection Campaign
(CIC) on Propulsion and Auxiliary Machinery**



Executive Summary

Deficiencies in the area of propulsion and auxiliary machinery account for approximately 7% of the total number of deficiencies in the Paris MoU and the Tokyo MoU. Compliance with the applicable provisions from Solas Ch.II-1 has never been assessed by a CIC before.

The Paris MoU on Port State Control (PMoU) and 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. During this campaign the focus was on the working order and maintenance of the main engines, auxiliary engines, auxiliary equipment and related alarm systems. Furthermore special attention was given to familiarity of the crew with safety and emergency procedures with regards to these systems.

During 2013 the member states of the PMoU have performed a Harmonised Verification Programme on passenger ship safety. Because of the additional inspection load due to the Havep passenger ships have been excluded from the scope of the CIC.

This report presents the results for the PMoU member states. Results for the TMoU member states are documented separately.

During the CIC period 3879 inspections with a recorded CIC questionnaire have been performed on 3843 individual ships. 667 inspections (17% of the total number of CIC inspections) resulted in a total of 1105 deficiencies related to the topic of the campaign.

In total 166 (4,3%) of the inspections with a recorded CIC resulted in the detention of the vessel. 68 (1,8%) of these inspections resulted in a detention on the account of a detainable deficiency covered by the CIC topic, which means that 41% of the detentions was CIC-topic related.

The deficiency recorded most frequently during the CIC was "13101 – Propulsion main Engine" (221 times) followed by "09232 – Cleanliness of the engine room" (203 times). These deficiencies, together with "4114 – Emergency lighting, batteries and switches", also have been the most recorded deficiencies as a ground for detention (25, 19 and 19 times respectively).

The most inspected ship type was general cargo/multipurpose ship with 1270 inspections (33%), followed by bulk carriers with 805 inspections (21%) and container ships with 458 inspections (12%). Refrigerated cargo ships had the highest CIC-topic related detention rate (3,7%) followed by general cargo ships (2,7%) and oil tankers (2,2%).

Ships with a ship age over 20 years old had an average CIC-topic related detention rate of 3.5%. For ships with an age between 5 and 20 years the average detention rate was 1.4% and for ships with an age of 5 years or less the average detention rate was 0,4%.

The flags with the highest CIC-topic related detention rate were Tuvalu (100%), followed by the United Republic of Tanzania (22%), Curacao (12,5%) and Togo (11%).

From the CIC-results it can be concluded that in general there is a good level of compliance with the provisions of Solas '74 Ch.II-1 covered by the scope of the CIC.

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1.Introduction

1.1 Purpose of this Report

This report documents the results of the Concentrated Inspection Campaign on Propulsion and Auxiliary Machinery which was carried out in the PMoU region from the 1st of September 2013 to the 30th of November 2013.

1.2 Objective of the CIC

Deficiencies in the area of propulsion and auxiliary machinery rank in the top-10 of deficiencies recorded during PSC inspections in the PMoU and TMoU. The purpose of the CIC on propulsion and auxiliary machinery was to get a detailed view of the compliance with the provisions of the relevant regulations from Solas Ch.II-1, especially with regards to the working order and maintenance of the main engine, auxiliary engines, auxiliary equipment and their related alarm systems. Furthermore the objective of the CIC was to verify the familiarisation of officers and crew members in charge of operation of propulsion and auxiliary machinery with the relevant safety and emergency procedures, and to raise awareness among the aforementioned crew on propulsion and auxiliary machinery related issues.

1.3 Scope of the CIC

The CIC applied to all types of ships except passenger ships. Since the PMoU was performing a HAVEP on passenger ship safety during 2013, which caused an additional inspection load on top of the regular PSC inspection, it was decided that no additional load of the simultaneous CIC should be put on top of that.

The CIC was to be performed, and the questionnaire to be filled, on every individual ship only once during the CIC period. To note is that 444 inspections have no CIC questionnaire recorded in the database. On the other hand 35 individual ships were subject to the CIC more than once

The CIC was performed during the regular PSC inspections and targeted 11 specific provisions from Solas Ch.II-1 related to propulsion and auxiliary machinery. These areas received a more in-depth examination during the regular PSC inspection.

1.4 General Remarks

General remarks to be included in the report:

- For the purpose of this report, a detention is an inspection containing at least one deficiency that is considered a ground for detention.
- The tables do not take into account inspections where the CIC questionnaire was not recorded, with exception of table 2.

2. Summary, Conclusions and Recommendations

2.1 Summary

The CIC questionnaire was recorded for 3879 inspections on 3843 individual ships. 444 inspections have been performed without a CIC questionnaire recorded in THETIS.

1592 inspections (41%) had no deficiencies. The other 2287 inspections (59%) resulted in a total number of 11296 recorded deficiencies. 1105 (9.8%) of the recorded deficiencies were CIC-topic related.

68 (1,8%) of the inspected ships were detained with a CIC-topic related deficiency as a ground for detention. These detentions account for 41% of the total number of detentions during the campaign. 2 detentions were due to a CIC-topic related detainable deficiency only. All other detentions also had detainable deficiencies not related to the CIC-topic.

The most recorded deficiencies as a ground for detention were:

- 13101 – propulsion main engine (25).
The questions relate to the operation and maintenance of, and familiarisation of the crew with, the oil mist detector (S74 Ch.II-1/R.47.2/R.27.5), and to the emergency operational drill to the main engine (S74 Ch.II-1/R.31);
- 09232 – Cleanliness of the engine room (19);
- 04114 – Emergency source of power, emergency generator (19).

Refrigerated cargo ships had the highest CIC-topic related detention rate (3,7%), followed by general cargo/multipurpose ships (2,7%), oil tankers (2,2%) and container ships (2,0%).

Although passenger ships were excluded from the CIC a CIC-questionnaire has been recorded for 16 passenger ships and 23 Ro-Ro passenger ships. No passenger ships have been detained on account of CIC-topic related deficiencies.

By ship risk profile the CIC-topic related detention rate is 6.4% for High Risk Ships, 1,6% for Standard Risk Ships and 0,8% for Low Risk Ships. As would be expected from the risk profiling system of the PMoU High Risk Ships showed by far the highest detention rate and CIC-topic related detention rate during the CIC-campaign, where Low Risk Ships showed the lowest detention rates.

By ship age the CIC-topic related detention rate increases from 0.4% for ships with an age of 5 years or less to an average of 1,4% for ships with an age between 5 and 20 years and an average of 3,5% for ships with an age of over 20 years.

During the campaign ships flying the flag of 85 different countries have been inspected. Tuvalu had the highest CIC-topic related detention rate (100%) followed by the United republic of Tanzania (22,2%), Curacao (12,5%), Togo (11,4%), the republic of Moldova (8.2%) and Belize (7,3). Tuvalu, Curacao and Belize are on the PMoU Grey list. The other countries are on the PMoU Black list. With regards to the 100% detention rate for Tuvalu it should be noted that only one Tuvalu flag ship has been inspected during the CIC-campaign and this vessel was detained.

7 CIC-topic related detentions have been recorded with RO responsibility.

The analysis of the CIC data showed, as in previous CIC's, inconsistencies between the data recorded in the CIC questionnaire and the deficiency and detention data recorded in THETIS.

The data presented in this report is based on the inspection and detention data as recorded in THETIS.

2.2 Conclusions

The results of the CIC do not show figures that appear to be out of line when compared to the general results found during regular PSC inspections¹. Therefore it can be concluded that in general there is a good level of compliance with the provisions of the Solas requirements covered by the scope of the CIC.

The results do show that the following 4 deficiencies together account for 62% of the CIC-topic related deficiencies:

- oil mist detectors or other automatic shut-off arrangements (20%);
- cleanliness of the engine room (18%);
- emergency source of power (12%);
- emergency lighting (12%).

2.3 Recommendations

Although in general the CIC showed that there is a good level of compliance with the Solas requirements related to propulsion and auxiliary machinery the CIC also showed that there are specific areas where a higher level of non-compliance exists. A continued focus on improvement, especially in these areas, is required.

¹ Average CIC deficiency and detention figures compared to the average deficiency and detention figures in the PMoU annual report 2012

3. CIC Questionnaire Results

3.1 Analysis

3.1.1 Response to CIC questionnaire

Table 1 Total number of inspections performed with a CIC questionnaire = 3879

Nr.	CIC Question	'YES'		'NO' ¹		N/A		Blank	
		#	% ²	#	% ²	#	% ³	#	% ³
Q01	Are instructions and manuals for ship machinery essential to safe operation, written in a language understood by the ship's personnel?	3796	98.3%	65	1.7%			18	0.5%
Q02	If the ship operates with periodically unattended machinery spaces, has it been provided with documentary evidence of fitness?	2817	96.5%	102	3.5%	946	24.5%	14	0.4%
Q03	Do the Oil Mist Detectors or any other automatic shut-off arrangements for the main engine and auxiliary engines appear to be in working order?	3061	97.1%	92	2.9%	710	18.4%	16	0.4%
Q04	Are protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electrical shock and other hazards?	3716	96.2%	148	3.8%			15	0.4%
Q05	Does propulsion machinery and essential auxiliaries appear to be in operational condition?	3772	97.6%	93	2.4%			14	0.4%
Q06	Is cleanliness of the Engine Room, including bilges satisfactory?	3638	94.2%	222	5.8%			19	0.5%
Q07	Do the Main or Auxiliary Boilers and Boiler Feed Systems appear to be in safe working order?	3139	97.8%	72	2.2%	644	16.7%	24	0.6%
Q08	Do the emergency sources of power and emergency lighting appear to be in working order?	3741	97.2%	109	2.8%			29	0.7%
Q09	Do the bilge pumping arrangements appear to be in good working order?	3817	98.9%	44	1.1%			18	0.5%
Q10	Where an emergency steering drill was witnessed, was it found to be satisfactory?	2706	98.4%	45	1.6%	1106	28.7%	22	0.6%
Q11	Where an emergency operational drill to main engine was witnessed, was it found to be satisfactory?	1255	92.4%	103	7.6%	2504	64.8%	17	0.4%
Q12	Has the ship been detained as a result of this CIC?	108	2.8%	3763	97.2%			8	0.2%

(1) 'NO' means: the ship may be considered for detention. The details of any detention should be appropriately entered on the PSC report form B.

(2) The percentages are calculated using the total number of inspections where the answer was "YES" or "NO" only.

(3) The percentages are calculated using the total number of inspections.

3.1.2 Analysis of answers to questionnaire

During the CIC campaign a total of 3897 CIC questionnaires have been completed.

Question 06, which asked whether the cleanliness of the engine room including the bilges is satisfactory, has by far the least favourable result with 222 times “NO” as an answer, representing 5.8% of the answers to this question.

Question 04 , with regards to protective arrangements for machinery to be in place, ranked second as least favourable result with 148 times “NO” (3,8%).

Question 11, asking whether an observed emergency operational drill to the main engine was found to be satisfactory, ranked high with 103 times “NO” out of a total of 1358 questions (7,6%)

Question 09, which asked whether the bilge pumping arrangements appeared to be in good working order, has the most favourable result with 44 times “NO” as an answer, representing 1.1% of the answers to this question

The percentage of unanswered questions is less than 1%.

In paragraph 3.1.5 a further analysis will be given of the answers to the questionnaire and the recorded deficiencies.

3.1.3 Number of inspections and number of ships in CIC

Table 2

	# of individual ships inspected during CIC	# of inspections performed with a CIC questionnaire	# of inspections without a CIC questionnaire
Total # of inspections	4127	3879	444
# of inspections with detentions	186	166	20
# of detentions with <i>CIC</i>-topic related deficiencies	73	68	5

During the period of the CIC 4323 inspections have been carried out. 3879 inspections (90%) included the recording of the CIC questionnaire.

Of the ships that were inspected with a CIC questionnaire a total of 166 ships were detained. 68 of these detentions were related to CIC-topic related deficiencies.

3.1.4 Specification of CIC-topic related deficiencies

Table 3

CIC-topic related deficiencies		Inspections	CIC-topic related detentions	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)
01303	Unattended machinery spaces (UMS) evidence	18	2	1
02105	Steering gear	94	6	2
04103	Emergency lighting, batteries and switches	128	9	2
04114	Emergency source of power - Emergency generator	130	19	1
08109	Boiler alarm	40	3	0
09232	Cleanliness of engine room	199	19	2
09233	Guards - fencing around dangerous machinery parts	89	2	1
10136	Establishment of working language on board	58	4	0
13101	Propulsion main engine	197	21	4
13104	Bilge pumping arrangements	44	7	1
13108	Operation of machinery	54	4	0

3.1.5 Analysis of CIC-topic related deficiencies

Deficiencies related to the CIC-topic are recorded in THETIS under their respective deficiency codes.

Question 03, related to the working order of oil mist detectors and other automatic shut-off devices, has 221 recorded deficiencies. Herewith this deficiency is the most recorded CIC-related deficiency. Question 06, with regards to engine room cleanliness, ranks second with 203 recorded deficiencies. Question 08, asking whether the emergency source of power and emergency lighting appear to be in good working order, ranks third and fourth. Questions 03, 06 and 08 have been recorded as a detainable deficiency 25 times, 19 times and 19 times (for code 4114) respectively during the CIC..

Question 2, with regards to the provision of documentary evidence of fitness for periodically unattended machinery spaces, has the most favourable result with only 18 recorded deficiencies.

As in previous CIC's also this CIC shows inconsistency between the questionnaire data and the deficiency and detention data. The table below shows the numbers of Yes and No answers in the questionnaire and the numbers of recorded CIC-topic related deficiencies:

Nr.	# 'YES' answers in the questionnaire	# 'NO' answers in the questionnaire	# Recorded CIC-topic related deficiencies
Q01	3796	65	60
Q02	2817	102	18
Q03	3061	92	221
Q04	3716	148	92
Q05	3772	93	56
Q06	3638	222	203
Q07	3139	72	41
Q08	3741	109	136, 132
Q09	3817	44	49
Q10	2706	45	97
Q11	1255	103	-- ^[1]
Q12	108	3763	68

The CIC guidelines give instructions to the PSCO on the items to be assessed during the CIC and what deficiency code to use in case of a deficiency. In accordance with the CIC instruction a deficiency shall be recorded when a question is answered with 'NO'. As the tables show there are, in some cases quit considerable, differences between the number of recorded "NO" answers and the recorded deficiencies.

In the cases where the number of "NO" answers is higher than the number of recorded deficiencies the explanation can be the fact that the PSCO has not recorded a deficiency, even though a non-compliance was found, or a deficiency has been recorded under a different deficiency code. For the cases where the number of recorded deficiencies is higher than the number of "NO" answers the explanation can be that more than one deficiency related to the CIC has been recorded, or deficiencies with regards to identified issues falling outside the scope of the CIC have been recorded with the particular deficiency code.

The conclusion is that the questionnaire and the recorded deficiencies must be taken individually and not as being directly related. They both give an individual impression of the level of compliance with the requirements covered by the CIC.

^[1] Deficiency codes used for this question are the same as used for Q3 and Q5. Distinction can only be made by assessing the individual general comment field recorded for each deficiency.

3.1.6 Number of ships to number of inspections during CIC campaign

Table 4

# of inspections performed per ship	# of ships	% of total
1	3808	99.1%
2	34	0.9%
3	1	0.0%
Total	3843	100.0%

For 99.1% of the ships that have been inspected during the CIC period one CIC questionnaire has been recorded. The remaining 0.9% of the inspected ships have been subject to the CIC more than once.

3.1.7 Number of inspected ships per Ship Risk Profile

Table 5

Ship Risk Profile	# of inspections	# of detentions	detention as % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as % of inspections
High Risk Ship (HRS)	249	32	12.9%	16	6.4%
Standard Risk Ship (SRS)	2769	122	4.4%	45	1.6%
Low Risk Ship (LRS)	610	8	1.3%	5	0.8%
Unknown	251	4	1.6%	2	0.8%
Total	3879	166	4.3%	68	1.8%

3.1.8 Number of inspected ships and detentions per ship type

Table 6

Ship type	# of inspections	# of detentions	detention as % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as % of inspections
Bulk carrier	805	29	3.6%	9	1.1%
Chemical tanker	343	5	1.5%	4	1.2%
Combination carrier	3	0	0.0%	0	0.0%
Commercial yacht	15	1	6.7%	0	0.0%
Container	458	12	2.6%	9	2.0%
Gas carrier	102	1	1.0%	0	0.0%
General cargo / multipurpose	1270	91	7.2%	34	2.7%
Heavy load	4	0	0.0%	0	0.0%
High speed passenger craft	2	0	0.0%	0	0.0%
NLS tanker	14	0	0.0%	0	0.0%
Offshore supply	81	2	2.5%	1	1.2%
Oil tanker	272	9	3.3%	6	2.2%
Other	33	0	0.0%	0	0.0%
Other special activities	147	6	4.1%	1	0.7%
Passenger ship	16	0	0.0%	0	0.0%
Refrigerated cargo	82	5	6.1%	3	3.7%
Ro-Ro cargo	142	2	1.4%	1	0.7%
Ro-Ro passenger ship	23	0	0.0%	0	0.0%
Special purpose ship	21	0	0.0%	0	0.0%
Tug	46	3	6.5%	0	0.0%
Total	3879	166	4.3%	68	1.8%

Table 6 shows the number of CIC inspections, the total number of detentions and the number the detentions with one or more CIC-related detainable deficiencies for various ship types.

The highest detention rate recorded is 7.2% for general cargo ships, which is high compared to the average detention rate in the PMoU in 2011 and 2012. For this ship type 2.7% of the detentions are with CIC topic related detainable deficiencies, which is below the average detention rate in the PMoU in 2011 and 2012.

The highest detention rate with CIC-topic related detainable deficiencies is recorded for refrigerated cargo ships with 3.7%

The figures in table 6 present the results of the CIC but should not be seen as representative for the ship types in general. Because of the small sample size a large uncertainty in the statistics exists.

3.1.9 Inspections and detentions per Flag State

During the CIC campaign ships from 85 different flag states were inspected. The table in Annex 1.4 presents the number of inspections, the number of detentions and the number of detentions with CIC-topic related detainable deficiencies for the various flag states as well as the ranking on the PMoU White, Grey and Black list for these countries.

The highest percentage of CIC-topic related detentions was recorded for Tuvalu (100%) followed by the United Republic of Tanzania (22,2%), Curacao (12,5%), Togo (11,4%) and the Republic of Moldova (8,2%).

Tanzania, Togo and Moldova are listed on the PMoU Black list. Tuvalu and Curacao are listed on the PMoU Grey list.

60 of the 85 flag states had no detention with a CIC-topic related detainable deficiency and 48 of the 85 flag states had no detentions at all during the period of the CIC.

The figures presented here reflect the inspection results found during the CIC, but should be interpreted with caution. In most instances the figures are based on a small sample size and should therefore not be taken as representative for the fleet flying the flag of that particular flag state. For Tuvalu for instance it should be noted that only one Tuvalu flag ship has been inspected during the CIC-campaign and this vessel was detained resulting in a detention rate of 100%.

3.1.10 Inspections and detentions per Recognized Organization

The table in Annex 1.5 presents the number of inspections by applicable certificate (501 and 504) and the number of detentions where a CIC topic related detainable deficiency has been marked with RO responsibility. A total of 7 detentions have been recorded with RO responsibility.

3.1.11 Ship age overview

Table 7

Ship age	# of inspections	# of detentions	Detention as % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as % of inspections
≤ 5 years	948	11	1.2%	4	0.4%
6-10 years	904	25	2.8%	13	1.4%
11-15 years	506	22	4.3%	5	1.0%
16-20 years	484	19	3.9%	9	1.9%
21-25 years	278	18	6.5%	11	4.0%
26-30 years	240	19	7.9%	8	3.3%
31-35 years	245	22	9.0%	8	3.3%
> 35 years	274	30	10.9%	10	3.6%
Total	3879	166	4.3%	68	1.8%

3.2 Results on former CIC's on same subject

Not applicable. A CIC on the subject of propulsion and auxiliary machinery has not been held before. (Table 8 is therefore not presented)

3.3 Results other CIC participants (if applicable)

3.3.1 Analysis

At the time of the preparation of this report not enough data was available to analyse the PMoU results of the CIC on Propulsion and Auxiliary Machinery compared with the results of other CIC participants. Therefore a comparison and analysis is not presented in this report.

3.3.2 Comparison of CIC-results with other participants

Table 9

	Paris MoU	Tokyo MoU	Black Sea MoU ^[2]	Other MoU
# of inspections	3879	PM	1097	
# of detentions	166	PM	31	
Detentions as % of inspections	4.3%	PM	2.8%	
Detentions with CIC-topic related deficiencies	68	PM	13	
Detentions with CIC-topic related deficiencies as % of inspections	1.8%	PM	1.2%	
Detentions with CIC-topic related deficiencies as % of detentions	41.0%	PM	41.9%	

^[2] Figures based on questionnaire responses, rather than information recorded in the database.

Annex 1

Annex 1.1 Inspection form of the CIC

Inspection Authority			
Ship Name		IMO Number	
Date of Inspection		Inspection Port	

No.	QUESTION	Yes	No	N/A
DOCUMENTATION				
1	Are instructions and manuals for ship machinery essential to safe operation, written in a language understood by the ship's personnel ? (Code 10136).	<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? (Code 01303).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MAIN ENGINE AND AUXILIARY ENGINES				
3	Do the Oil Mist Detectors or any other automatic shut-off arrangements for the main engine and auxiliary engines appear to be in working order? (Code 13101)	<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? (Code 09233)	<input type="checkbox"/>	<input type="checkbox"/>	
5	Does propulsion machinery and essential auxiliaries appear to be in operational condition ? (Code 13108).	<input type="checkbox"/>	<input type="checkbox"/>	
6	Is cleanliness of the Engine Room, including bilges satisfactory? (Code 09232).	<input type="checkbox"/>	<input type="checkbox"/>	
AUXILIARY MACHINERY				
7	Do the Main or Auxiliary Boilers and Boiler Feed Systems appear to be in safe working order? (Code 08109).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Do the emergency sources of power and emergency lighting appear to be in working order? (Code 04114)	<input type="checkbox"/>	<input type="checkbox"/>	
9	Do the bilge pumping arrangements appear to be in good working order? (Code 13104).	<input type="checkbox"/>	<input type="checkbox"/>	
OPERATIONAL CONTROLS				
10	Where an emergency steering drill was witnessed, was it found to be satisfactory? (Code 02105)	<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? (Code 13101, Code 13108).	<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 Additional Instructions for the CIC

The CIC should be held on all ships, **except passenger ships!**

Guidelines on the Concentrated Inspection Campaign (CIC) on Propulsion and Auxiliary Machinery

1. INTRODUCTION

- .1 The deficiencies related to propulsion and machinery installations on average in the last 3 years, account for 7% of the total number of deficiencies within the Tokyo and Paris MoU's, ranking number six in comparison with all the deficiencies by categories statistics.
- .2 A CIC on Propulsion and Auxiliary machinery has never been carried out by the Tokyo and Paris MOU.
- .3 Compliance of ships with provisions of the International Convention on Safety of Life at Sea Ch II-1 has never been assessed by any CIC.
- .4 Taking all the above into consideration, at the 21st session of the Tokyo MOU Committee meeting (PSCC21) and the 45th meeting of the Paris MoU Committee (PSCC45), it was agreed that a joint CIC between the Paris and Tokyo MoU's is to be held in 2013 in order to verify the compliance with the Propulsion and Auxiliary machinery requirements and the provisions of the International Convention SOLAS Ch II-1 on all types of ships.

2. GENERAL

- .1 The guidelines are a tool for the PSCO to be familiar with the requirements of the Convention. It is not intended nor expected that the PSCO will be using the guidelines as a check list; PSCOs will use their professional judgment to the extent of using the guidelines and the items to check pertaining to each question.
- .2 The campaign will target aspects of compliance provisions of SOLAS Chapter II-1 on all vessels regardless of type. The campaign is designed to examine a specific area and is not intended to detract from normal coverage of Port State Control Inspections. The CIC will be conducted in conjunction with the regular Port State Control targeting system.
- .3 In principle the PSC inspection performed during the campaign is subject to one CIC only.

3. PURPOSE

- .1 The purpose of the campaign on Propulsion and Auxiliary Machinery is to get a detailed view of the compliance of the relevant regulations.
- .2 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 shall comply with the requirements of the Convention as appropriate.
- .3 It is responsibility of the Flag State to ensure all vessels comply with the requirements of Ch II-1 as amended.

4. SCOPE AND OBJECTIVE

The scope of the CIC is the safety of propulsion and auxiliary machinery, especially the working order and maintenance of the main engines, auxiliary engines, auxiliary equipment and their related alarm system. Special attention will be given to familiarity of the crew with safety and emergency procedures with regard to the main engine, auxiliary engines and auxiliary equipment.

With this scope, the CIC is to ensure that:

- There is compliance with the requirements of the SOLAS convention as applicable.
- There is a compliance with the safety of propulsion and auxiliary machinery, especially the working order and maintenance of the main engine, auxiliary engines, auxiliary equipment and their related alarm systems.
- All officers or crew members in charge of operation of propulsion and auxiliary machinery are familiarized with safety and emergency procedures with regard to the main engine, auxiliary engines and auxiliary equipment.
- To raise awareness among engine crew on propulsion and auxiliary machinery related issues.

5. DOCUMENTATION

The following guidance is provided to assist in checking for compliance of SOLAS Chapter II-1 during the CIC. In addition PSCOs should refer to the following documentation:

SOLAS 74: Safety of life at sea Chapter II-1.

Unless expressly provided otherwise, for ships constructed before 1 January 2009, the Administration shall ensure that the requirements which are applicable under chapter II-1 of the International Convention for the Safety of Life at Sea, 1974, as amended by resolutions MSC.1(XLV), MSC.6(48), MSC.11(55), MSC.12(56), MSC.13(57), MSC.19(58), MSC.26(60), MSC.27(61), Resolution 1 of the 1995 SOLAS Conference, MSC.47(66), MSC.57(67), MSC.65(68), MSC.69(69), MSC.99(73), MSC.134(76), MSC.151(78) and MSC.170(79) are complied with.

6. OTHER REFERENCES FOR INFORMATION PURPOSES ONLY

The following Resolutions and Circulars are for information purposes only and as such are generally regarded as editorial guidance to flag states and should not be construed as regulations to be applied by PSCO's:

MSC/Circ.1139; Conditions applicable to propulsion control automation system of Ships built after 1 July 1986, but before 1 July 2004 (Solas Regulation II-1/31).

MSC.1/Circ.1398; Unified interpretation of Solas Regulation II-1/29.

MSC.1/Circ.1345; Unified interpretation of Solas Regulation II-1/27.5. (Machinery shut-off arrangements and oil mist detector arrangements).

MSC.1/Circ.1286; Unified interpretation of Solas Regulation II-1/32.

MSC/Circ.834; Guidelines for Engine-room lay-out, design and arrangement.

MSC/Circ.647; Guidelines to minimize leakage from flammable liquid systems.

MSC.1/Circ.1372; Guidance for application of Solas regulation II-1/41.6

7. OTHER INFORMATION

In arriving at a "YES" or "NO" answer to each of the questions, the following needs to be considered:

- Should a question be answered "NO", a deficiency using the appropriate deficiency code listed in the question shall be used on the report of inspection Form "B".
- A "NO" answer in the questionnaire should not automatically lead to the detention of the ship. In this case, the PSCO should use his/her professional judgment to determine whether the vessel should be considered for detention.
- The column "N/A" shall only be used if the question cannot be answered.
- Reporting in the database should be in accordance with normal procedures for a CIC in the module which will be made available in the database from 1 September to 30 November 2013.
- The applicable deficiency codes are indicated in the explanatory notes for each question.

8. EXAMINATION OF CERTIFICATES AND DOCUMENTS

For the purpose of the CIC at the initial inspection the PSCO will, as a minimum, examine the following Certificates and Documents:

- Cargo ship construction certificate
- Cargo ship safety certificate
- Minimum safe manning document
- Certificate of Class for vessels with unattended machinery spaces
- Safety Management Certificate
- Maintenance plan for propulsion and auxiliary machinery
- Records of machinery continuous survey arrangement
- Periodical inspections records for alarms and safeguard on automatic and remote control equipment
- Records of safety device test for propulsion and auxiliary machinery
- Training plan / Emergency preparedness drills

Annex 1.3 Explanatory notes to the questions

1 Are Instructions and manuals for ship machinery essential to safe operation, written in a language understood by the ship's personnel ?

S74/CII-1/R26.10; (Def Code 10136).

The PSCO should check that:

- Operation and maintenance instructions are written in a language understood by ship's personnel. (S74/CII-1/R26.10).
- Officers and crew members are able to read and understand operating and maintenance instructions and engineers drawings for ship machinery and equipment essential to safe operation .(S74/CII-1/R26.10).
- A working language is established on board and recorded in the logbook. (S74/CV/R14.3).

For ships constructed on or after 1-7-1986

Solas Chapter II-1/R26.10 requires that operating and maintenance instructions and engineering drawings for ship machinery and equipment essential to the safe operation of the ship shall be written in a language understandable by those officers and crew members who are required to understand such information in the performance of their duties.

All ships

Solas Chapter V/R14.3 requires that on all ships, to ensure effective crew performance in safety matters, a working language shall be established and recorded in the ship's log-book. The company, as defined in regulation IX/1, or the master, as appropriate, shall determine the appropriate working language. Each seafarer shall be required to understand and, where appropriate, give orders and instructions and to report back in that language. If the working language is not an official language of the State whose flag the ship is entitled to fly, all plans and lists required to be posted shall include a translation into the working language.

STCW Code A-III/1 requires holders of engineering certificates of competency to have adequate knowledge of the English language to enable them to use engineering publications and to perform engineering duties.

2 If the ship operates with periodically unattended machinery spaces, has it been provided with documentary evidence of fitness?

S74/CII-1/R46.3; (Def Code 01303).

The PSCO should check that:

- The vessel holds an Unattended Machinery Space Document (UMS) issued by the Administration or a classification society. (S74/CII-1/R46.3)¹
- Minimum Safe Manning Document should contain information that the ship is manned as UMS. (S74/CV/R14.2). (Requirements to Officers and Ratings are usually written on the Minimum Safe Manning Document when the ship is manned as UMS)
- Crew List is available to verify if the ship is manned in accordance with the Safe Manning Document

¹ Each classification society has its own class notation for indicating that the ship has been built and equipped to operate with periodically unattended machinery spaces, of which the most common are found in the following table :

Lloyds Register of Shipping	UMS
Det Norske Veritas	E0
American Bureau of Shipping	ABCU or ACCU
Germanischer Lloyd	AUT (but not AUT-Z !)

In case the ships does not have periodically unattended machinery spaces the answer is "N/A".

For ships constructed on or after 1-9-1984

Ships under Solas II-1 Reg 46.3 shall be provided with documentary evidence, to the satisfaction of the Administration, of its fitness to operate with periodically unattended machinery spaces.

Minimum Safe Manning Document as per SOLAS V Reg 14.2 shall be provided by the Administration as evidence of the minimum safe manning considering necessary all ships be sufficiently and efficiently manned.

3 Do the Oil Mist Detectors or any other automatic shut-off arrangements for the main engine and auxiliary engines appear to be in working order?

S74/CII-1/ R47.2/ R27.5; (Def Code 13101).

The PSCO should check that:

- Engine crew is familiarized with location, operational procedures and testing of oil mist detector. (S74/CII-1/R47 /R27.5).
- Engine crew is able to make a simple test of oil mist detector, even if main engine is stopped.
- In ships where an engine bearing temperature monitors or equivalent devices instead of oil mist detector are installed, the PSCO should verify that system has been tested. (S74/CII-1/ R47 /R27.5).
- Engine Crew is familiarized the operation and testing of L.O. low pressure trip devices to Main Engine.

For ships constructed on or after 1-9-1984

UMS Ships - Solas Chapter II-1/R47.2 (Fire precautions) requires that internal combustion engines of 2250 kW and above or having cylinders of more than 300mm bore shall be provided with crankcase oil mist detectors or engine bearing temperature monitors or equivalent devices.

Solas Chapter II-1/R27.5¹ (Machinery) requires that main turbine propulsion machinery and, where applicable, main internal combustion propulsion machinery and auxiliary machinery shall be provided with automatic shut-off arrangements in the case of failures such as lubricating oil supply failure which could lead rapidly to complete breakdown, serious damage or explosion. The Administration may permit provisions for overriding automatic shutoff devices

Note.- Some flags have not required the OMD to be arranged as mandatory for cargo ship diesel engine with 2250 Kw and cylinder bore 300 mm instead of L.O. trip system except for UMS ship. Reason as follow : Existing text of Solas Chapter II-1/R27.5 is not clear described about the OMD and using sentence "where applicable" is not mandatory depend on the understanding by the Administration, therefore some flags couldn't require the OMD to be arranged for a ship except UMS ship.

¹ Msc.1/Circ..1345 Unified interpretation of Solas Regulation II-1/27.5. (Machinery shut-off arrangements and oil mist detector arrangements): "The OMD arrangements (or engine bearing temperature monitors or equivalent devices) are part of the automatic shut-off arrangements required by SOLAS regulation II-1/27.5, in the case of medium and high-speed diesel engines of 2,250 kW and above or having cylinders of more than 300 mm bore. For the case of low speed diesel engines of 2,250 kW and above or having cylinders of more than 300 mm bore, the OMD arrangements (or engine bearing temperature monitors or equivalent devices) should initiate the alarm and slow down procedures. The consequences of overriding automatic shut-off arrangements should be established and documented."

4 Are protective arrangements for machinery in place to minimize danger to persons with regard to moving parts, hot surfaces, electric shock and other hazards?

S74/CII-1/R26.1; (Def Code 09233).

The PSCO should check that:

- Main engine and auxiliary engines with flywheel covers are duly installed. (Solas Chapter II-1/R26.1).
- Exhaust gas manifold from main engine and auxiliary engines are in good condition and duly protected. (Solas Chapter II-1/R26.1).
- Turbochargers gas inlet/outlet to main and auxiliary engines are duly protected. (Solas Chapter II-1/R26.1).
- Coupling cover to main compressors is duly installed. (Solas Chapter II-1/R26.1).
- Guards and fencing to machinery and belt driven pumps are in place and duly installed. (Solas Chapter II-1/R26.1).
- Fuel oil and lubricating oil pipe system are duly maintained and properly insulated. (Solas Chapter II-1/R26.1).
- Boilers (incl. insulation cover, man hole covers, valves, water, steam and fuel oil pipe system, gauge glass mounting) be duly protected and insulated. (Solas Chapter II-1/R26.1).
- Each electric switchboard (incl. emergency switchboard) both in the front and behind be provided with a non-conducting matting (material). (Solas Chapter II-1/R45).
- Breakers panel doors and electrical motor closure had been checked for damage or missing doors. (Solas Chapter II-1/R45).
- Lights throughout accommodations, bathrooms and engine room had been checked and found with globes and fitted guards. (Solas Chapter II-1/R45).
- Electrical wiring had been examined and properly supported and in good condition. (Solas Chapter II-1/R45).
- Electrical wiring had been checked for open circuits. (Solas Chapter II-1/R45).

For ships constructed on or after 1-9-1984

Solas Chapter II-1/R26.1 requires that the machinery, boilers and other pressure vessels, associated piping systems and fittings shall be of a design and construction adequate for the service for which they are intended and shall be so installed and protected as to reduce to a minimum any danger to persons on board, due regard being paid to moving parts, hot surfaces and other hazards. The design shall have regard to materials used in construction, the purpose for which the equipment is intended, the working conditions to which it will be subjected and the environmental conditions on board.

It should be noted that means to prevent oil spray provided on flange/joint in oil piping and insulation for all surfaces of machinery with high temperature, above 220°C fall under Solas 74/88 Ch II-2/15.2 and Solas 74/00 ChII-2/2/4.

Solas Chapter II-1/R45 requires that:

1.1 Exposed metal parts of electrical machines or equipment which are not intended to be live but which are liable under fault conditions to become live shall be earthed unless the machines or equipments are:

.1 supplied at a voltage not exceeding 50V direct current or 50V, root mean square between conductors ; autotransformers shall not be used for the purpose of achieving this voltage; or

.2 supplied at a voltage not exceeding 250V by safety isolating transformers supplying only one consuming device; or

.3 constructed in accordance with the principle of double insulation.

1.2 The Administration may require additional precautions for portable electrical equipment for use in confined or exceptionally damp spaces where particular risks due to conductivity may exist.

1.3 All electrical apparatus shall be so constructed and so installed as not to cause injury when handled or touched in the normal manner.

2 Main and emergency switchboards shall be so arranged as to give easy access as may be needed to apparatus and equipment, without danger to personnel. The sides and the rear and, where necessary, the front of switchboards shall be suitably guarded. Exposed live parts having voltages to earth exceeding a voltage to be specified by the Administration shall not be installed on the front of such switchboards. Where necessary, non-conducting mats or gratings shall be provided at the front and rear of the switchboard.

3.1 The hull return system of distribution shall not be used for any purpose in a tanker, or for power, heating, or lighting in any other ship of 1,600 tons gross tonnage and upwards.

3.2 The requirement of paragraph 3.1 does not preclude under conditions approved by the Administration the use of:

- .1 impressed current cathodic protective systems;
- .2 limited and locally earthed systems; or
- .3 insulation level monitoring devices provided the circulation current does not exceed 30 mA under the most unfavourable conditions.

3.2-1 **For ships constructed on or after 1 October 1994**, the requirement of paragraph 3.1 does not preclude the use of limited and locally earthed systems, provided that any possible resulting current does not flow directly through any dangerous spaces.

3.3 Where the hull return system is used, all final sub circuits, i.e. all circuits fitted after the last protective device, shall be two-wire and special precautions shall be taken to the satisfaction of the Administration.

4.1 Earthed distribution systems shall not be used in a tanker. The Administration may exceptionally permit in a tanker the earthing of the neutral for alternating current power networks of 3,000V (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces.

4.2 When a distribution system, whether primary or secondary, for power, heating or lighting, with no connection to earth is used, a device capable of continuously monitoring the insulation level to earth and of giving an audible or visual indication of abnormally low insulation values shall be provided.

4.3 **Ships constructed on or after 1 October 1994**, in lieu of the provisions of paragraph 4.1, shall comply with the following requirements:

- .1 Except as permitted by 4.3.2 earthed distribution systems shall not be used in a tanker.
- .2 The requirement of paragraph 4.3.1 does not preclude the use of earthed intrinsically safe circuits and in addition, under conditions approved by the Administration, the use of the following earthed systems:
 - .2.1 power supplied, control circuits and instrumentation circuits where technical or safety reasons preclude the use of a system with no connection to earth, provided the current in the hull is limited to not more than 5 amps in both normal and fault conditions; or*
 - .2.2 limited and locally earthed systems, provided that any possible resulting current does not flow directly through any of the dangerous spaces; or*
 - .2.3 alternating current power networks of 1,000V root mean square (line to line) and over, provided that any possible resulting current does not flow directly through any of the dangerous spaces.*

5.1 Except as permitted by the Administration in exceptional circumstances, all metal sheaths and armour of cables shall be electrically continuous and shall be earthed.

5.2 All electric cables and wiring external to equipment shall be at least of a flame-retardant type and shall be so installed as not to impair their original flame-retarding properties. Where necessary for particular applications the Administration may permit the use of special types of cables such as radio frequency cables, which do not comply with the foregoing.

5.3 Cables and wiring serving essential or emergency power, lighting, internal communications or signals shall so far as practicable be routed clear of galleys, laundries, machinery spaces of category

A and their casings and other high fire risk areas. Cables connecting fire pumps to the emergency switchboard shall be of a fire-resistant type where they pass through high fire risk areas. Where practicable all such cables should be run in such a manner as to preclude their being rendered unserviceable by heating of the bulkheads that may be caused by a fire in an adjacent space.

5.4 Where cables which are installed in hazardous areas introduce the risk of fire or explosion in the event of an electrical fault in such areas, special precautions against such risks shall be taken to the satisfaction of the Administration.

5.5 Cables and wiring shall be installed and supported in such a manner as to avoid chafing or other damage.

5.6 Terminations and joints in all conductors shall be so made as to retain the original electrical, mechanical, flame-retarding and, where necessary, fire-resisting properties of the cable.

6.1 Each separate circuit shall be protected against short circuit and against overload, except as permitted in regulations 29 and 30 or where the Administration may exceptionally otherwise permit.

6.2 The rating or appropriate setting of the overload protective device for each circuit shall be permanently indicated at the location of the protective device.

7 Lighting fittings shall be so arranged as to prevent temperature rises which could damage the cables and wiring, and to prevent surrounding material from becoming excessively hot.

8 All lighting and power circuits terminating in a bunker or cargo space shall be provided with a multiple-pole switch outside the space for disconnecting such circuits.

9.1 Accumulator batteries shall be suitably housed, and compartments used primarily for their accommodation shall be properly constructed and efficiently ventilated.

9.2 Electrical or other equipment which may constitute a source of ignition of flammable vapours shall not be permitted in these compartments except as permitted in paragraph 10.

9.3 Accumulator batteries shall not be located in sleeping quarters except where hermetically sealed to the satisfaction of the Administration.

10 No electrical equipment shall be installed in any space where flammable mixtures are liable to collect, e.g. in compartments assigned principally to accumulator batteries, in paint lockers, acetylene stores or similar spaces, unless the Administration is satisfied that such equipment is: (Replaced by Res.MSC.170(79))

.1 essential for operational purposes;

.2 of a type which will not ignite the mixture concerned;

.3 appropriate to the space concerned; and

.4 appropriately certified for safe usage in the dusts, vapours or gases likely to be encountered.

11 In tankers, electrical equipment, cables and wiring shall not be installed in hazardous locations unless it conforms with standards not inferior to those acceptable to the Organization.* However, for locations not covered by such standards, electrical equipment, cables and wiring which do not conform to the standards may be installed in hazardous locations based on a risk assessment to the satisfaction of the Administration, to ensure that an equivalent level of safety is assured. (Adopted by Res.MSC.170(79))

* Refer to the standards published by the International Electro technical Commission, IEC 60092-502:1999 'Electrical installations in ships - Tankers'.

5 Does propulsion machinery satisfactory and essential auxiliaries appear to be in operational condition ?

S74/CII-1/R26.3 (Def Code 13101).

The PSCO should check that:

- The condition of the essential machinery and of the electrical installations is such that they are capable of providing continuous power for propulsion and for auxiliary services.
Special attention to operational condition of the following:
 - Auxiliary engines with their electrical generators. If one electrical generator is out of commission, the PSCO should investigate whether power available to maintain essential services. (Solas Chapter II-1/R26.3).
 - Fuel oil supply system for main engine (including pumps, pipelines and purifiers).
 - Lubricating oil system for main engine (including pumps, pipelines and purifiers) (Solas Chapter II-1/R26.3).
 - Jacket cooling F.W. Pumps for main engine and auxiliary engines. (including pipelines, coolers and heaters). (Solas Chapter II-1/R26.3).
 - Air system for main engine (including starting air compressors, starting air receiver and starting air piping). (Solas Chapter II-1/R26.3).
 - Sea water cooling system for main engine (including pumps, coolers and pipelines). (Solas Chapter II-1/R26.3).

For ships constructed on or after 1-9-1984

Solas Chapter II-1/R26.3 requires that means shall be provided whereby normal operation of propulsion machinery can be sustained or restored even though one of the essential auxiliaries becomes inoperative. Special consideration shall be given to the malfunctioning of:

- .1 a generating set which serves as a main source of electrical power ;
- .2 the sources of steam supply ;
- .3 the boiler feedwater systems ;
- .4 the fuel oil supply systems for boilers or engines ;
- .5 the sources of lubricating oil pressure ;
- .6 the sources of water pressure ;
- .7 a condensate pump and the arrangements to maintain vacuum in condensers ;
- .8 the mechanical air supply for boilers ;
- .9 an air compressor and receiver for starting or control purposes ;
- .10 the hydraulic, pneumatic or electrical means for control in main propulsion machinery including controllable pitch propellers.

6 Is cleanliness of the engine room, including bilges satisfactory?

S74/CII-1/26.7; (Def Code 09232).

The PSCO should check that:

- There is not any oil leaking from the main engine or auxiliary engines.
- Engine room is clean and tidy.
- No oily residues and rags under bilges
- Purifier room is clean and oil residues removed from this space.
- Bilges under auxiliary engines are clean and free of oil residues.
- Engine room floor plates are free from oil and not slippery.

For ships constructed on or after 1-9-1984

Solas Chapter II-1/R26.7 requires that provision shall be made to facilitate cleaning, inspection and maintenance of main propulsion and auxiliary machinery including boilers and pressure vessels.

7 Do the Main or Auxiliary Boilers and Boiler Feed Systems appear to be in safe working order ?

S74/CII-1/R/32; (Def Code 08109).

The PSCO should check that:

- The lagging be in place and in good condition (Solas Chapter II-1/R26.1).
- The safety valves easing gears/wires are in good working order. (Last record of testing should be verified). (Solas Chapter II-1/R32.1)
- The boiler gauge glasses or direct reading gauge are in good working order (clean and the water level can be seen .
- The second means of indicating water level is in good working order. (Solas Chapter II-1/R32.6)
- All pressure gauges working properly. (Solas Chapter II-1/R26)
- The feed water supply system (including pumps and piping are in good working order. (Solas Chapter II-1/R32.4)
- The safety arrangements for boilers without manual supervision are in a working order (including alarm and shut off for low water level; air supply failure, flame failure). (Solas Chapter II-1/R32.2)
- Cascade Tank is free of tracing of oil or other contaminants. (Solas Chapter II-1/R32.5)

Note: It's not expected that safety valves should be tested during CIC campaign.

For ships constructed on or after 1-9-1984

Solas Chapter II-1/R32.1 requires that every steam boiler and every unfired steam generator shall be provided with not less than two safety valves of adequate capacity. However, having regard to the output or any other features of any boiler or unfired steam generator, the Administration may permit only one safety valve to be fitted if it is satisfied that adequate protection against overpressure is thereby provided.

Solas Chapter II-1/R32.2 requires that each oil-fired boiler which is intended to operate without manual supervision shall have safety arrangements which shut off the fuel supply and give an alarm in the case of low water level, air supply failure or flame failure.

Solas Chapter II-1/R32.4 requires that every steam generating system which provides services essential for the safety of the ship, or which could be rendered dangerous by the failure of its feed water supply, shall be provided with not less than two separate feed water systems from and including the feed pumps, noting that a single penetration of the steam drum is acceptable. Unless overpressure is prevented by the pump characteristics means shall be provided which will prevent overpressure in any part of the systems.

Solas Chapter II-1/R32.5 requires that boilers shall be provided with means to supervise and control the quality of the feed water. Suitable arrangements shall be provided to preclude, as far as practicable, the entry of oil or other contaminants which may adversely affect the boiler.

Solas Chapter II-1/R32.6 requires that every boiler essential for the safety of the ship and designed to contain water at a specified level shall be provided with at least two means for indicating its water level, at least one of which shall be a direct reading gauge glass.

8 Do the emergency sources of power and emergency lighting appear to be in working order?

S74/CII-1/R42, 43, 44; (Def Code 04103, 04114)

The PSCO should check that:

- The means of starting of emergency generators sets are in good condition of maintenance and in good working order (Solas Chapter II-1/R44).
- The starting batteries for the emergency generator are in good order and stowed properly in the battery locker. (Solas Chapter II-1/R44)
- The emergency source of power is in good condition of maintenance and in good working order. (Solas Chapter II-1/R43)

- Emergency generator: test operation (as far as possible) and automatic starting arrangements; fuel oil tank level and condition of starting devices should be checked during inspection. (Solas Chapter II-1/R44)
- All emergency lights are in good order, (without damage, no bulbs are missing, protection covers are fitted). (Solas Chapter II-1/R42,43).

For cargo ships constructed before 01-09-1984, under Solas 60-74 Chapter II-1/R26:

- > 5000 GT must have emergency source of power good for 6 hours.
- Maybe either batteries or generator with starting arrangement to the satisfaction of Administration (may be manual).
- < 5000 GT must have emergency source good for 3 hours at launching station and other places as required by Administration.

For ships constructed on 01-09-1984 and after, under Solas 74 Chapter II-1/R43.3:

- The emergency source may be either batteries or generator.

For ships constructed on 01-09-1984 and after, under Solas 74 Chapter II-1/R43.3.2:

- If generator is fitted it shall be started and put on load automatically unless a transitional source of power is provided.
- In auto start mode a single source of stored energy use to start must be protected to preclude its complete depletion, otherwise a second independent means of starting is to be provided.

For ships constructed on 01-09-1984 and after, under Solas Chapter II-1/R44.1:

- The emergency generator must be capable to start at 0° C.
- If lower Temp° is to be encountered, heating arrangement to be fitted to ensure ready starting.

For ships constructed on 01-09-1984 and after, under Solas Chapter II-1/R44.2:

- In auto start mode the generator must be fitted with starting device with stored energy capability of three (3) consecutive starts.
- A second source of stored energy shall be provided for an additional three (3) starts within 30 minutes unless manual start can be demonstrated.

For ships constructed on 01-10-1994 and after, under Solas Chapter II-1/R44.2.1:

- In auto start mode the source of stored energy must be protected from depletion unless a second independent means of starting is provided.
- In addition a second source of energy shall be provided with three (3) starts within 30 minutes. The second source of energy is not required if manual start can be demonstrated.

For ships constructed on 01-09-1984 and after, under Solas Chapter II-1/R44.3/44.3.1/44.3.2/44.3.2/44.4.1/44.4.2:

- The stored energy must be maintained as follows:
 - + Electric and hydraulic starting system maintained from emergency Switchboard.
 - + Compressed air maintained by main or auxiliary compressor air Receiver or by emergency air compressor.
 - + If the emergency air compressor is electrically driven it must be Supplied from the emergency switchboard.
 - + All starting, charging and storing devices are to be located in the emergency generator space.
 - + If the auto start is not required then manual start is permissible.
 - + If manual start is not practicable, the stored energy used as per 44.2 and 44.3 may be manually initiated.

9 Do the bilge pumping arrangements appear to be in good working order?

S74/CII-18/ CII-1/R21; S74/CII-1/R35-1(Def Code 13104)

The PSCO should check that:

- All bilge lines are in good working order (no evidence of corrosion, hole, trace of leaking, patching). (Solas Chapter II-1/R21/35-1)
- All gauges attached to the pumps and piping system are working properly. (Solas Chapter II-1/R26)
- All distribution boxes and manually operated valves are in good working order and free of leaking. (Special attention to overboard discharge valves and sea suction valves). (Solas Chapter II-1/R21.1.5/35-1)
- All bilge pumps are in good condition of maintenance and operating properly. (No evidence of leakage through the seals or glands, no patches on pumps casing). (Solas Chapter II-1/R21/35-1)
- Bilge pumping system has not evidence of illegal connection, (connected to pumps other than approved as bilge pumps. (Solas Chapter II-1/R21.1.2/35-1)

For cargo ships constructed on or after 1-9-1984 and before 1-1-2009 apply Solas Chapter II-1/R21.

1 Cargo Ships

1.1 An efficient bilge pumping system shall be provided, capable of pumping from any draining any watertight compartment other than a space permanently appropriated for the carriage of fresh water, water ballast, oil fuel or liquid cargo and for which other efficient means of pumping are provided, under all practical conditions. Efficient means shall be provided for draining water from insulated holds.

1.2 Sanitary, ballast and general service pumps may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

1.3 All bilge pipes used in or under coal bunkers or fuel storage tanks or in boiler or machinery spaces, including spaces in which oil-settling tanks or oil fuel pumping units are situated, shall be of steel or other suitable material.

1.4 The arrangement of the bilge and ballast pumping system shall be such as to prevent the possibility of water passing from the sea and from water ballast spaces into the cargo and machinery spaces, or from one compartment to another. Provision shall be made to prevent any deep tank having bilge and ballast connections being inadvertently flooded from the sea when containing cargo, or being discharged through a bilge pipe when containing water ballast.

1.5 All distribution boxes and manually operated valves in connection with the bilge pumping arrangements shall be in positions which are accessible under ordinary circumstances.

At least two power pumps connected to the main bilge system shall be provided, one of which may be driven by the propulsion machinery. If the Administration is satisfied that the safety of the ship is not impaired, bilge pumping arrangements may be dispensed with in particular compartments.

For cargo ships constructed on or after 1-1-2009 apply Solas Chapter II-1/35-1.

10 Where an emergency steering drill was witnessed, was it found to be satisfactory?

S/74CII-1/R29; (def Code 02105)

The PSCO's should check that:

- The main and auxiliary steering gear are so arranged that the failure of one of them does not render the other inoperative. (S/74/88/CII-1/R29.1).
- Where appropriate, essential components of the steering gear are permanently lubricated or provided with lubrication fittings. (S74/88/CII-1/R29.2.1)

- Relief valves are fitted to any part of a steering gear hydraulic system which can be isolated and in which pressure can be generated from the power source or from external forces and that relief valves are set to a pressure not exceeding the design pressure (S74/88/CII-1/29.2.3).
- The main and auxiliary steering gear power units restart automatically when power is restored after a power failure, that they are capable of being brought into operation from a position on the navigating bridge and, that, in the event of a power failure to any one of the steering power units, and audible and visual alarm is given on the navigation bridge. (S74/88/RII-1/R29.5.1).
- Where the main steering gear comprises two or more identical power units and an auxiliary steering gear is not fitted, a defect can be isolated so that steering capability can be maintained or speedily regained after a single failure in its piping system or in one of the power units. (S74/88/CII-1/R29.6.3).
- The control system for the main steering gear from both the navigating bridge and the steering gear compartment are operating satisfactorily. (S74/88/CII-1/R29.5.2).
- Simple operating instructions with a block diagram showing the change-over procedures for remote steering gear control systems and steering gear unit shall be permanently displayed on the navigation bridge and in the steering compartment (S74/CV/R26).

Also the PSCO should determine whether responsible ship's personnel are familiar with their duties related to operate steering system in emergency situations, such as:

- The main steering system (Solas Chapter II-1/R29.3).
- The auxiliary steering system (Solas Chapter II-1/R29.4).
- The remote steering gear control system (Solas Chapter II-1/29.5.1).
- The steering position located on the navigation bridge. (Solas Chapter II-1/29.5.2).
- The emergency power supply (Solas Chapter II-1/R30.1).
- The rudder angle indicators in relation to the actual position of the rudder (Solas Chapter II-1/R29.11).
- The remote steering gear control system power failure alarm. (Solas Chapter II-1/29.5.1).
The steering gear power unit failure alarms. (Solas Chapter II-1/29.5.2).
- The full movement of the rudder according to the required capabilities of the steering gear. (Solas Chapter II-1/R29.3.2).
- The operation of the means of communication between the navigation bridge and steering gear compartment. (Solas Chapter II-1/R29.10).
- The procedures for changing from one system to another. (Solas Chapter II-1/R29.8).

Note: Before starting with emergency steering drill, a general examination of main and auxiliary steering gear should be carried out.

The drill shall include direct control within the steering gear compartment, the communications procedures with the navigation bridge and, where applicable, the operation of alternative power supplies.

For ships constructed on or after 1-9-1984 apply Solas Chapter II-1/R29

Note: Retroactive Requirement for Existing Ships ; for oil tankers, chemical tankers and gas carriers constructed before 1 Sep. 1984, there are some retroactive requirements in this regulation as indicated in paragraphs 19 and 20 .

11 Where an emergency operational drill to main engine was witnessed, was it found to be satisfactory?

S74/CII-1/R31; (Def Code 13101, 13108)

The PSCO should verify that:

- Training plans available and with records up dated.
- Emergency drill is carried out at intervals defined in training plans.
Some of the most common emergency drills established in Training Plans are:

- Main engine failure drill.
- Machinery Break Down.
- Loss of Throttle/RPM control from bridge.
- Changeover of control (Wheelhouse-Control Room-Engine side).
- Operation of Manoeuvring handles after "Auto Stop".
- Responsible ship's personnel are familiar with their duties related to emergency situations with main engine.
- Evidence from the PSCO general impressions and observations that key crew members are not familiar with emergency drill to main engine described as emergency preparedness in the SMS, operational emergency drill to main engine may be required.

In particular the following procedures and testing shall be observed:

- Proper communication from Bridge to Engine Control Room. (S74/CII-1/R37)
- Telegraphs order properly monitored. (S74/CII-1/R31.2.4).
- Starting air low pressure alarm. (Under regulation II-1/31.2.9 of Solas convention, an alarm shall be provided on the navigation bridge and in the machinery spaces to indicate low starting air pressure).
- Change over control from Bridge to Engine Room. (S74/CII-1/R31.2.5).
- Change over control from Engine room to local/emergency control. (S74/CII-1/R31.2.6).
- Proper operation of emergency stopping device to the main propulsion machinery. This stopping device on the navigating bridge shall be independent of the navigating bridge controls system.(S74/CII-1/R31.2.3).
- Alarm and restarting after starting failure.
- Changeover of control station at black out. (Bridge > control room > local control).
- Operation and manoeuvring from Engine side control. (Under regulation II-1/31.6 of Solas Convention, it shall be possible to control the propulsion machinery locally, even in the case of failure in any part of the remote control system).

GUIDELINES FOR CONTROL OF OPERATIONAL REQUIREMENTS :

Note:

- The PSCO should not include any operational test or impose physical demands which in the judgment of the Master could jeopardize the safety of the ship, crew, passengers, controls officers or cargo.
- When carrying out operational control, the PSCO should ensure, as far as possible, no interference with normal shipboard operations, such as loading and unloading of cargo and ballasting.
- The PSCO has to exercise professional judgment to determine whether the operational proficiency of the engine crew as a whole is of a sufficient level to allow the ship sail without danger to the ship or persons on board ,or presenting an unreasonable threat of harm to the marine environment .
- When assessing the crew's ability to conduct an operational drill, the mandatory minimum requirements for familiarization and basic training of seafarers, as stated in the Convention STCW, shall be used as a benchmark.

STCW CODE PART A CH VIII/PART 3-2 SUB 63, 65

63: When the machinery spaces are in the manned condition, the officer in charge of the engineering watch shall at all times be readily capable of operating the propulsion equipment in response to needs for changes in direction or speed.

65: All bridge orders shall be promptly executed. Changes in direction or speed of the main propulsion units shall be recorded, except where an Administration has determined that the size or characteristics of a particular ship make such recording impracticable. The officer in charge of the engineering watch shall ensure that the main propulsion unit controls, when in the manual mode of operation, are continuously attended under stand-by or manoeuvring conditions.

12 Has the ship detained as a result of the CIC?

The question requires a “Yes or “No” response, take note this question relates only to detainable deficiencies found from completing the CIC questionnaire

If a ship is detained as a result of deficiencies found from the item listed in the questionnaire, PSCO’s should respond “Yes” to question 13.

If a ship is detained as a result of deficiencies found from a broader PSC inspection, PSCO’s should respond “No” to question 13.

Annex 1.4 Inspections and Detentions per Flag State

Table Annex 1.4

Flag	# of inspections	# of detentions	Detention as % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as % of inspections	WGB- list* 2012
Albania	7	2	28.6%	0	0.0%	Black
Algeria	2	0	0.0%	0	0.0%	Grey
Antigua and Barbuda	246	9	3.7%	3	1.2%	White
Bahamas	124	3	2.4%	2	1.6%	White
Bahrain	1	0	0.0%	0	0.0%	unlisted
Barbados	26	0	0.0%	0	0.0%	White
Belgium	10	0	0.0%	0	0.0%	White
Belize	41	6	14.6%	3	7.3%	Grey
Bermuda (UK)	12	0	0.0%	0	0.0%	White
Bolivia	1	0	0.0%	0	0.0%	Black
Bulgaria	3	0	0.0%	0	0.0%	Grey
Cambodia	28	3	10.7%	1	3.6%	Black
Canada	1	0	0.0%	0	0.0%	unlisted
Cayman Islands (UK)	19	1	5.3%	0	0.0%	White
China	18	0	0.0%	0	0.0%	White
Comoros	14	3	21.4%	0	0.0%	Black
Cook Islands	26	5	19.2%	1	3.8%	Grey
Croatia	8	0	0.0%	0	0.0%	White
Curacao	16	3	18.8%	2	12.5%	Grey
Cyprus	156	5	3.2%	1	0.6%	White
Denmark	83	1	1.2%	1	1.2%	White
Dominica	2	1	50.0%	0	0.0%	Black
Ecuador	1	0	0.0%	0	0.0%	unlisted
Egypt	3	0	0.0%	0	0.0%	Grey
Estonia	2	0	0.0%	0	0.0%	White
Faroe Islands	17	0	0.0%	0	0.0%	White
Finland	23	0	0.0%	0	0.0%	White
France	13	0	0.0%	0	0.0%	White
Germany	48	3	6.3%	2	4.2%	White
Gibraltar (UK)	56	2	3.6%	1	1.8%	White
Greece	73	1	1.4%	1	1.4%	White
Honduras	2	0	0.0%	0	0.0%	Black
Hong Kong, China	158	4	2.5%	1	0.6%	White
India	8	0	0.0%	0	0.0%	Grey
Indonesia	1	0	0.0%	0	0.0%	unlisted
Iran, Islamic Republic of	6	0	0.0%	0	0.0%	White

Flag	# of inspections	# of detentions	Detention as % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as % of inspections	WGB- list* 2012
Ireland	13	0	0.0%	0	0.0%	White
Isle of Man (UK)	42	0	0.0%	0	0.0%	White
Israel	2	0	0.0%	0	0.0%	unlisted
Italy	66	2	3.0%	0	0.0%	White
Japan	5	0	0.0%	0	0.0%	White
Kazakhstan	6	0	0.0%	0	0.0%	Grey
Korea, Republic of	8	0	0.0%	0	0.0%	White
Latvia	9	0	0.0%	0	0.0%	White
Lebanon	5	0	0.0%	0	0.0%	Black
Liberia	322	8	2.5%	5	1.6%	White
Libya	4	1	25.0%	0	0.0%	Black
Lithuania	8	0	0.0%	0	0.0%	White
Luxembourg	14	0	0.0%	0	0.0%	White
Malaysia	1	0	0.0%	0	0.0%	Grey
Malta	317	13	4.1%	6	1.9%	White
Marshall Islands	211	4	1.9%	0	0.0%	White
Moldova, Republic of	49	4	8.2%	4	8.2%	Black
Morocco	1	0	0.0%	0	0.0%	Grey
Netherlands	217	7	3.2%	3	1.4%	White
Norway	91	2	2.2%	0	0.0%	White
Palau	1	0	0.0%	0	0.0%	unlisted
Panama	495	32	6.5%	13	2.6%	White
Philippines	9	0	0.0%	0	0.0%	White
Poland	14	1	7.1%	1	7.1%	White
Portugal	14	0	0.0%	0	0.0%	White
Qatar	2	0	0.0%	0	0.0%	unlisted
Russian Federation	91	6	6.6%	0	0.0%	White
Saint Kitts and Nevis	20	1	5.0%	0	0.0%	Black
Saint Vincent and the Grenadines	62	6	9.7%	3	4.8%	Grey
Saudi Arabia	7	0	0.0%	0	0.0%	Grey
Seychelles	1	0	0.0%	0	0.0%	unlisted
Sierra Leone	34	2	5.9%	1	2.9%	Black
Singapore	118	0	0.0%	0	0.0%	White
Slovenia	1	0	0.0%	0	0.0%	unlisted
Spain	15	1	6.7%	0	0.0%	White
Sri Lanka	1	0	0.0%	0	0.0%	unlisted
Sweden	19	0	0.0%	0	0.0%	White
Switzerland	12	0	0.0%	0	0.0%	Grey

Flag	# of inspections	# of detentions	Detention as % of inspections	# of detentions CIC-topic related	Detentions CIC-topic related as % of inspections	WGB- list* 2012
Tanzania, United Republic of	27	10	37.0%	6	22.2%	Black
Thailand	6	0	0.0%	0	0.0%	White
Togo	35	7	20.0%	4	11.4%	Black
Tunisia	2	0	0.0%	0	0.0%	Grey
Turkey	113	3	2.7%	0	0.0%	White
Tuvalu	1	1	100.0%	1	100.0%	Grey
Ukraine	16	0	0.0%	0	0.0%	Grey
United Arab Emirates	1	0	0.0%	0	0.0%	unlisted
United Kingdom	78	1	1.3%	1	1.3%	White
United States	18	0	0.0%	0	0.0%	White
Vanuatu	20	2	10.0%	1	5.0%	White
Total	3879	166	4.3%	68	1.8%	

* The official WGB-list (2012) of the Paris MoU is published in the Annual Report.
The scope of this table is only the CIC.

Annex 1.5 Inspections and detentions per Recognized Organization

Table Annex 1.5

Issuing authority	Inspection*		Detentions CIC-topic related with RO responsibility**
	501 – CSSC certificate	504 – CSS certificate	
American Bureau of Shipping	260	5	
American Register of Shipping	1	0	
ASIA Classification ACS	1	0	
Bulgarian Register of Shipping	13	0	
Bureau Veritas	383	108	1
China Classification Society	53	0	
Croatian Register of Shipping	10	0	
Det Norske Veritas	384	15	
Dromon Bureau of Shipping	43	1	
Germanischer Lloyd	623	39	2
Global Marine Bureau Inc.	6	0	
Global Shipping Bureau Inc	3	0	
Hellenic Register of Shipping	4	0	
Honduras Maritime Inspection Inc.	1	0	
Indian Register of Shipping	3	0	
Inspeccion y Clasificacion Maritima (INCLAMAR)	4	1	
Intermaritime Certification Services, ICS Class	3	0	
International Maritime Register	1	0	
International Naval Surveys Bureau	41	0	1
International Register of Shipping	13	1	
Iranian Classification Society	4	0	
Isthmus Bureau of Shipping, S.A.	3	2	
Korean Register of Shipping	1	1	
Lloyd's Register	61	54	
Macosnar Corporation	368	0	
Maritime Bureau of Shipping	4	0	
Maritime Lloyd - Georgia	7	0	1
National Shipping Adjuster Inc.	14	0	
Nippon Kaiji Kyokai	1	5	
Other	454	1	
Overseas Marine Certification Services	6	0	
Panama Marine Survey and Certification Services Inc.	4	0	
Panama Maritime Documentation Services	1	0	

Issuing authority	Inspection*		Detentions CIC- topic related with RO responsibility**
	501 – CSSC certificate	504 – CSS certificate	
Panama Shipping Registrar Inc.	1	0	
Phoenix Register of Shipping	2	0	
Polski Rejestr Statkow (Polish Register of Shipping)	13	3	
Register of Shipping	7	0	
Registro Italiano Navale	123	3	1
Russian Maritime Register of Shipping	189	0	
Shipping Register of Ukraine	41	0	
Turkish Lloyd	2	0	
Universal Shipping Bureau Inc.	4	0	1
Venezuelan Register of Shipping	16	0	
Total	3184	239	7

* 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