

# Port State Control Inspection Procedures: The Selection of Ships Revisited

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## Abstract

*The paper aspires to contribute to a more accurate selection of ships to be inspected and to commence a debate upon the actual benefits of Port State Control inspections as are today. We compare data given by the Department of Merchant Shipping of Cyprus concerning the inspection and the recorded deficiencies and detentions of ships under Cyprus Flag by PSC authorities per day for the period 1999-2003 and official IMO casualty reports for the period 2000-2003. This comparison leads to the conclusion that there are some inadequacies affecting the selection of ships to be inspected. Then these inadequacies are to some extent proved by applying the Paris MoU target factor on ships involved in casualties finding out that a dangerous vessel can in many cases avoid PSC. The paper concludes with, what may seem at a glance as, loud suggestions to overcome problems such as the repeated and unnecessary inspection and therefore unjustified delay of high standard ships or the hereby hypothesis of “under-inspected” dangerous vessels. These are problems caused by the selection procedure flaws and it is towards these procedure flaws that the paper aims. Nevertheless, as much as the suggestion may seem excessive, it is our belief that in order to achieve a high standard of shipping one must be ready to debate upon suggestions of such extremity.*

## Keywords

PSC inspections; Paris MoU target factor; critical review; Cyprus Flag ships; Sub-Standard vessels

## 1. Introduction

It has been since its formal implementation that Port State Control inspections have been an issue of conflict and controversy between the various actors of the industry. The benefits of yet another sovereign authority upon the ships were turbid as ports were getting more and more crowded rising doubts to whether the prize that had to be paid for safer shipping was worth this unprecedented inspection anxiety. The aim of this paper is to critically review the said authorities' demonstrated efficiency through the selection of ships to be inspected by comparing two separate sources of data; The study compares data taken from the Department of Merchant Shipping of Cyprus concerning the daily recorded deficiencies and detentions of Cyprus Flag ships (1) by Port

State Control throughout the world for the period 1999-2003 and official IMO casualty statistics (2) for the period 2000-2003. We then focus on the ParisMoU ship selection procedures' efficiency under the logical assumption that any conclusions drawn using Paris MoU information can be generalized so as to provide a broader picture of world port state control actual efficiency; It is noted that the official criteria that are implemented to select a ship for PSC inspection are more or less the same around the world. As quoted in (Paris MoU website): 'The Paris MoU has been a blueprint for the introduction of regional regimes of port State control in the Asia Pacific Rim (Tokyo MoU), Latin America (Viña del Mar), the Mediterranean, Caribbean and other emerging regional port State control regimes. Canada and Russia are members of both the Paris MoU and the Tokyo MoU.'

In effect we define the PSC efficiency as the accuracy in selecting the ships to be inspected. In other words: Are truly dangerous ships chosen for inspection by PSC authorities, or is there a possibility that all this inspection ado is oriented towards the wrong direction (Roussos, 2007)? The study tries not only to answer this question but goes even further by pointing out the assumed inadequacies affecting the selection process.

The rest of the paper is structured as follows: in Section 2 the available data and the implications occurred through their utilization are described; furthermore, the two implemented data sets are adequately compared with the development of a collective comparative table. This table is then explained in Section 3 by applying the Paris MoU target factor upon sank vessels. Section 4 identifies the actual defect in the selection procedure and quotes a possible solution. The paper is concluded with Section 5 that covers some interesting insights from the aforementioned tasks.

## 2. Data Description and Comparison

### 2.1 Comparing the Data

A complete evaluation of the world PSC authorities' efficiency could have resulted by carefully monitoring every ship in the world registry and recording the inspections upon it. In this way one could have judged whether the inspections held (or avoided) were based on objective hazards or other causes. Since such research is obviously unfeasible; yet under the effort to draw

valid conclusions for the benefits of the Memoranda, this study chooses to interpret the aforementioned piece of information to draft a comparative table. For a period of four years from 2000 to 2003 each casualty of a Cyprus Flag ship is recorded and subsequently the vessels involved are thoroughly scanned so as to determine when they were inspected by a PSC authority for the last time.

The first column lists the IMO Number of the ship involved to the casualty while the second shows the date of the casualty (an indicative sample can be found in the Appendix of this paper). Whenever the third column is labeled as UNKNOWN it means that the corresponding casualty occurred within the first six months of 1999 and therefore the previous PSC inspection is not known as data from the Cyprus Registry are limited not before 1999. Whenever the same column is labeled as NO RECENT INSPECTION, it means that the ship involved in the casualty is without inspection for more than 6 months. The results of the comparison are concentrated in collective Table 1 which is self-explainable. In an astonishing conclusion, 57 out of the total 62 Cyprus ships involved in a casualty for the period 2000-2003 have not been inspected by PSC authority for over 6 months, most of them even for over 1 or 2 years (Roussos, 2007).

**Table 1: Number of Cyprus Ships' casualties and corresponding inspections by Paris MoU for the years 2000-2003.**

Year	Casualties of Cyprus Ships as per IMO official statistics	Ships not inspected by any PSC for more than 6 months, later involved in a casualty	Percentage of ships not inspected for over 6 months
2000	17	15	88.24%
2001	23	22	95.65%
2002	15	14	93.33%
2003	7	6	85.71%
<b>TOTAL</b>	<b>62</b>	<b>57</b>	<b>91.94%</b>

It must be pointed out that the six month comparison period is not used randomly. At the years of the study, six months was the maximum allowable time set by the Paris MoU for every ship to be inspected at least once, irrelevant to whether it was above or below standard.

### 3. Justifying Table 1: Possible explanations fallen

Appendix 1 and its derivative, Table 1 rise questions of critical importance (Roussos, 2007). One way or another Table 1 must be explained in a way that it justifies the seeming fact of casualty prevention incompetence by PSC authorities. Why do the enhanced inspections benefit quality shipping if not preventing casualties? How do the enhanced inspections benefit quality ship-

ping if they appear to concentrate upon the wrong ships?

The first argument to justify Table 1 has to do with the casualties that were actually prevented. Still, these kinds of conclusions cannot be drawn lightly since a decrease in the number of casualties, if any, is uncertain to whether and to what extent can be accredited to PSC activities. What is certain however, is the content of Table 1.

A second explanation could be constituted by admitting that all 62 above mentioned ships have been chartered for over six months in waters controlled by a minor MoU and therefore non inspection is solely caused by an unavoidable lack of resources in reference to developing countries port authorities. Since there has been a formal acknowledgement of the necessity for financial and technological support of the said port authorities, any further argument is insipid blathering. This is an argument that cannot definitely be rejected as there is no information regarding the 62 ships' routing at the time of the casualty. However, this argument can be described as statistically extreme as it states that 91.94% of all Cyprus Flag ships involved in a casualty had not visited a European, North American, Russian Japanese or Australian port – to mention the most important – for over six months. This argument only becomes less probable when considering the very nature of commerce. 'It takes two to commerce' and world economical status assures that at least one is a developed country and thus member of a traditional wealthy and powerful MoU (Kidman, 2002, Goulandris, 2003).

#### 3.1 Justifying Table 1: Testing the Paris MoU Target Factor

So far no reasonable explanation could be given so as to explain the figures of Table 1. There seems to be an endogenous inadequacy to the ship selection procedure as Table 1 cannot be explained otherwise. In other words the targeting of ships may well be out of target. There is but one way to establish this: Put the Targeting procedure to the test. In this paper the Paris MoU Target Factor is applied upon ships already involved in a casualty in an 'a posteriori' targeting.

Hence the following question could be posed: Would have all aforementioned 62 ships be chosen for inspection if they were to visit a Paris MoU port today, using the current (same as at the time of the casualties) targeting system? Or could the inspection be avoided due to a final target factor less than 50? The following is an application of this test. Note that whenever there is missing information, the maximum allowed mark is used. Hence, the target factor is applied and assessed upon a ship that suffered a given casualty (Tables 2 and 3); it is noted that the IMO number is concealed at Table 2 for obvious reasons (Roussos, 2007).

It is also noted that since she was not inspected for more

than two years (for verification see Appendix) it was taken that the vessel did not enter Paris MoU district. The result gives very interesting insights to whether she would have been inspected had she visited a European port. Also please note that items: “Not inspected in last 6 months’ and “Detained during past 12 months” are not completed, when the query item “Not Entered a region port for the last 12 months” is filled.

**Table 3: Casualty details**

Place of Casualty	DATE of LAST INSPECTION	Lives lost	Date of Casualty
Mozambique	No Recent Inspection No Inspection found after Jan. 1999	12	23-Jul-01

**Table 2: Ship involved in a casualty details**

IMO No	Name	TYPE	Build Year
772xxxx	SHIP 1	RORO Cargo	1978

The Paris MoU Target Factor is completed on line (Paris MOU website). The results are shown in Table 4

**Table 4: The Paris MoU target factor applied upon a sank ship**

Generic Factor			
<b>Targeted Flag</b>	On annual ParisMoU black list	Medium risk	Points: 4
<b>EU recognised classification society</b>		NO (this info is unknown therefore the maximum mark is given)	Points: 3
<b>Targeted ship type</b>	Is the vessel a : Bulk Carrier more than 12 years old, a Gas Carrier more than 10 years old, a Chemical Tanker more than 10 years old, an Oil Tanker >3000gt and > 15 years old or a Passengership/Ro-Ro ferry?	NO	Points: 0
<b>Ships more than 12 years old</b>	Graduated for non-targeted ship types (ref. above) and passenger ships	Age: 21 - 24	Points: 2
<b>Flag state has ratified all conventions</b>	(ref. relevant instruments in Paris Memorandum text, ratification information can be found in IMO website and ILO website)	NO (this info is unknown therefore the maximum mark is given)	Points: 1
<b>Class deficiency ratio above average</b>	as identified in MoU annual statistics	4% or more (this info is unknown therefore the maximum mark is given)	Points: 3
Historic factor			
<b>Not Entered a region port for the last 12 months</b>		Yes	Points: 20
Items: ‘Not inspected in last 6 months’, ‘Detained during past 12 months’, ‘Number of deficiencies per inspection during the last 12 months’ and ‘Outstanding deficiencies from last inspection’ are not considered when item: ‘Not Entered a region port for the last 12 months’ is true.			
<b>TARGET FACTOR: 33</b>			

It is repeated that the critical value for the Target Factor mark is 50 points. Though a ship is still eligible for inspection even for values below 50, it is more likely to avoid the inspection, especially in cases of crowded ports.

The above example sets an unexpected as well as a high concern to the efficiency of the described system. In effect, a ship that was proved to be a true hazard would most probably avoid inspection. The problem becomes clearer by retesting the targeting system upon another

sank ship from the Registry (flag) of Cyprus. Again the ship and casualty details are quoted in Tables 5 and 6, respectively (Roussos, 2007).

**Table 5: Ship involved in a casualty details**

IMO No	Name	TYPE	Build Year
901xxx	SHIP 2	Tanker ship	1991

**Table 6: Casualty details**

Place of Casualty	DATE of LAST INSPECTION	Lives lost	Date of Casualty
Denmark	No Recent Inspection Last inspection on 16/8/2000 at Norfolk USA	0	11-Sep-02

**Table 7: The Paris MoU target factor applied upon a sank ship**

Generic Factor			
<b>Targeted Flag</b>	On annual ParisMoU black list	Medium risk	Points: 4
<b>EU recognised classification society</b>		NO (this info is unknown therefore the maximum mark is given)	Points: 3
<b>Targeted ship type</b>	Is the vessel a : Bulk Carrier more than 12 years old, a Gas Carrier more than 10 years old, a Chemical Tanker more than 10 years old, an Oil Tanker >3000gt and > 15 years old or a Passengership/Ro-Ro ferry?	NO	Points: 0
<b>Ships more than 12 years old</b>	Graduated for non-targeted ship types (ref. above) and passenger ships	Age: 11	Points: 0
<b>Flag state has ratified all conventions</b>	(ref. relevant instruments in Paris Memorandum text, ratification information can be found in IMO website and ILO website)	NO (this info is unknown therefore the maximum mark is given)	Points: 1
<b>Class deficiency ratio above average</b>	as identified in MoU annual statistics	4% or more (this info is unknown therefore the maximum mark is given)	Points: 3
Historic factor			
<b>Not Entered a region port for the last 12 months</b>		Yes	Points: 20

Items: 'Not inspected in last 6 months', 'Detained during past 12 months', 'Number of deficiencies per inspection during the last 12 months' and 'Outstanding deficiencies from last inspection' are not considered when item: 'Not Entered a region port for the last 12 months' is true.

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**TARGET FACTOR: 31**

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The insufficiency of the system is revealed from the presentation of this example as well. In this outline, the selection activities along with the calculation of the target factor should be thoroughly examined in order to determine the weak chains of the procedure.

**3.2 Recent developments of the targeting system**

The target of Paris MOU (mainly driven by the EC) to increase the inspection rate of ships from 25% to 100%

(if possible) can be a major evolvement in terms of PSC efficiency and productivity. This can aid to avoid all selection procedures and concentrate in the actual identification of safety related problems onboard ships.

However the most important development regarding the improvement of the targeting system may have to do with the long awaited new inspection regime that will be exploiting a system of risk based profiling of ships to be inspected (Devanney, 2006). This has not yet been ap-

plied, nor described in full detail so as for the shipping community to know what lies ahead in these matters; it is noted that many stakeholders expect such a development and they believe that this can be a significant step forward with interesting and impressive results. Furthermore, a system based on this type of components focusing on the selection of a ship to be inspected could impede ship operators to predict the vessels that could be eligible for the conduction of a PSC inspection – and therefore avoid it – but it could also produce unnecessary inspections upon high standard ships; since the determinative criteria are not well known yet (Devaney, 2006).

#### 4. The Targeting System Actual Defect

As mentioned above, the Paris MoU has been the blueprint for the development of the structure of other Memoranda and therefore the same criteria govern the ship selection procedure for all. Thus any recommendations made to one, have an evidently general relevance.

Section 3.1 shows that proven dangerous ships is possible to shun a PSC inspection. A thorough evaluation of the marks gathered by the two test cases presented in this paper exposes the actual inadequacy of the system tested, attesting also the possibility of substandard vessels to be able to evade a PSC inspection.

The Historic factor composition is detected to be one of the causes of the malfunction. To be more specific, the criterion: ‘Not entered a region port for the last 12 months’ originates a series of omissions and contradictions. Again note that criteria: ‘Not inspected in last 6 months’, ‘Detained during past 12 months’ and ‘Number of deficiencies per inspection during the last 12 months’ that are located below the disputed criterion contribute to zero Target points if the discussed criterion is true. When a ship trades for over 12 months outside Paris MoU territory and then enters a port of the Memorandum, it automatically collects 20 points thus increasing its chances of being inspected regardless of the vessel’s actual standard. Consequently high standard and substandard ships trading outside the Memorandum area of responsibility are equated in face of the historic factor criteria. The relevant weight of the discussed criterion is so significant, that combined with the minimal points that the Generic Factor contributes to, results to misleading guidance. For example consider two ships that have been trading outside the Paris MoU for over 12 months: The first one is a 2-3 years old well maintained and the second 20 years old badly operated and maintained. The discussed criterion’s supremacy renders both as equally eligible for inspection.

The charging of these 20 points just because the vessel was operated outside the MoU is very interesting and requires further study and elaboration. It really does nothing less than to target not only the vessels but all

other Memoranda as well (Roussos, 2007). To give an (extreme) example this targeting system actually implies that the Paris MoU considers the USCG to be less efficient; hence it assigns 20 extra Target points to all vessels reaching its ports coming from the US.

#### 4.1 An alternative solution

The new inspection regime is awaited for more than three years. It is supposed to introduce likelihood in what could be a purely deterministic decision ignoring the side effects of such arbitrariness. Despite of common belief, the application of risk based methodologies should not always be viewed as panacea; the complexity of the technique, the bulk volume of data needed, the definition of acceptance criteria and the documentation of acceptance criteria can constitute samples of its weakness. An effort to review the regime should obviously be characterized by ease of use, flexibility and the capability of realistic results. To this end, the rational selection of ships to be finally inspected should be based upon transparent procedures and methodologies with adequate justification. Thus other ways must be found in order to surpass the insufficiency of the selection process, without radically changing it into something of vague consequences.

One way of dealing with the presented defects that govern the algorithm of the selection process is to create a collective database by combining all the databases used by the various Memoranda. Hence when a ship enters a MoU that had not visited for more than 12 months, the other criteria (the ones that are currently below ‘Not entered a region port for the last 12 months’) could be activated using data from the central database. In this way no ship could hide its deficiencies and a more accurate selection would be possible. However, such actions can succeed under the condition of equal ability and consciousness by all Memoranda; a very difficult and rather optimistic anticipation/fact. Should the databases combine without doing something about the minor Memoranda’s financing and training, there would be no progress to the quality of shipping as a non-inspection of a substandard ship in a developing country due to lack of resources or any other reason, would be confused with a non-inspection due to tactical reasons when the ship is considered for inspection in a major MoU (tactical reasons meaning that the ship was not inspected because it was thought to be of acceptable standard). For that reason a combined database can only serve its purpose when all Memoranda have reached a satisfactory level of competence (Roussos, 2007).

Since such competence is very difficult to be obtained by most of the developing authorities, the paper proposes an original corrective measure to be applied: the various Memoranda to be classified in lists, just like the flags are listed in the white/grey/black lists. Can this be an answer to the flaw detected in Section 3.1? In effect, each Memorandum status can be described by a specific mark as quoted in Table 6 (Roussos, 2007).

**Table 6: Classification of Memoranda referring to the criterion: ‘Not entered a region port for the last 12 months’**

MOU	+TF
A MoU	0
B MoU	5
C MoU	20
D MoU	40

In this way, the Target Factor will calculate the criterion: ‘Not entered a region port for the last 12 months’ based on the previous port’s Memorandum status diminishing the effects of ineffectiveness by e.g. developing countries’ Memoranda (Roussos, 2007). The technical details regarding the authority and the means of classification is not discussed in this paper but is recommended for further research and elaboration.

## 5. Conclusions

By comparing data taken from the Department of Merchant Shipping of Cyprus with official IMO casualty statistics, the efficiency of the PSC targeting procedures is put under the spotlight and assessed accordingly. The first conclusion is repeated: 57 out of the total 62 Cyprus ships involved in a casualty for the period 2000-2003 have not been inspected by PSC authority for over 6 months, most of them even for over 1 or 2 years. Even though the conclusion that the current PSC system has problems should not come as a surprise, it is always astonishing to realise that there could have been such a massive ineffectiveness.

By this point the study has only revealed a global ineffectiveness of the PSC authorities yet affecting only the Cyprus Flag ships. Therefore no global conclusions can be drawn until a similar study for every major registry is issued – a study that is truly due.

Still, by applying the Paris MoU Target factor upon two sank (thus truly hazardous) ships we conclude that these ships could have avoided the inspection - a conclusion that is irrelevant to the flag Registry and can unarguably take a global sense. In other words, the study of the Cyprus Registry has merely been the pretext for a deeper look and a chance to duly generalise the conclusions: Many problems seem to arise from the supremacy and unwarranted use of the criterion: ‘Not entered a region port for the last 12 months’.

In order to face this problem and avoid radical (and therefore uncertain and perhaps doubtful) inspection regime changes, the paper concludes with an interesting and dynamic suggestion: To classify the various Memoranda based on their recorded performance and efficiency, a task proposed for further study. Therefore, the

targeting of a ship for inspection would be also affected by its previous mooring location(s); hence whether it was within or outside the MOU limits and not by taking into account only generic and historic factors, in their current form.

## 6. References

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## Appendix

Below an illustrative sample of the data elaborated in this paper can be found.

IMO No	DATE of CASUALTY	PREVIOUS DATE OF PSC INSPECTION	DEFICIENCIES FOUND	DETAINED Yes/No
xxx	30-Aug-99	NO RECENT INSPECTION		
xxx	13-Feb-99	13-Oct-99	3	Y France
xxx	29-Apr-99	UNKNOWN		
xxx	8-Nov-99	19-Sep-99	8	Y Germany
xxx	28-Oct-00	NO RECENT INSPECTION		
xxx	8-Jul-00	29-Feb-00	6	N USA
xxx	10-Jan-00	NO RECENT INSPECTION		
xxx	28-Feb-00	28-Sep-99	11	Y Belgium
xxx	15-Apr-01	NO RECENT INSPECTION		
xxx	21-May-01	NO RECENT INSPECTION		
xxx	30-Jun-01	9-Mar-01	1	Y USA
xxx	24-Jul-02	8-Apr-02	6	Y Netherlands
xxx	11-Sep-02	NO RECENT INSPECTION		
xxx	29-Jun-03	1-Apr-03	9	Y Netherlands
xxx	31-Jan-03	NO RECENT INSPECTION		