STATISTICAL PROCESS CONTROL ANALYSIS OF MARITIME VESSELS

Introduction:

We have successfully inspected almost fifty percent of total assigned vessels, and have sufficient information to analyze the vessels. ***"A vessel is as good as its crew and crew is as good as the management on board"***. In this competitive market, it is important to have:

1. Proactive customer relationship
2. Optimal vessel management
3. Value added services

Now-a-days, customers do not want only "***Cheapest solution***" rather "***Value added solutions***". A creditable track record attracts customers and most importantly retains them. So it is imperative to have a reliable and uniform management system on board.

Average age of inspected vessels is 4.5 years, which can be considered as very young fleet. Structurally, vessels are quite good. Now the question arises, how will be the vessels after few years down the line? This will depend on the on board maintenance system. Again on board management holds the key for future vessel condition. This leads to another thought, whether the present "Management System" on board will suffice or change is required!!

To analyze the same, we have asked 366 questionnaires (Appendix-3) to each vessel. The result is as follows:

Vessel Name	Number question asked (A)	Number of questions not meeting requirements (B)	% age (B/A)	Managed by	Master's Nationality	Age Of Vessel
Sambhar	366	30	8.2	BBG	Nationality1	1
America	366	33	9.02	BBG	Nationality1	1
Jamaica	366	28	7.65	BBG	Nationality1	1
Berlioz	366	42	11.48	CMA	Nationality2	6
Orion	366	55	15.03	CMA	Nationality3	10
Aquarius	366	62	16.94	CMA	Nationality3	10

Assumption:

- For this analysis model, we will name column B(Number of questions not meeting requirements) as "Findings"

- In ideal world a vessel will have 0 % findings, but in real world, no vessel is perfect and we will stick to 95 % confidence.

Calculation is given for reference of data plotted in graph.

Calculation:

1. *Total number of "Findings" = 250*

2. *p = Average "Findings" per vessel in percentage = (250 / (366 x 6)) x 100 = 11.38%*

3. *SD= Standard Deviation (from Poisson's probability distribution) = 1.6 %*

4. *For 3 sigma we have = 3 * SD = 4.8 %*

5. *Upper limit of acceptable range of Findings = p + 3 x SD = 16.19%*

6. *Lower limit of Findings = p- 3 x SD = 6% which corresponds to almost 95% (94%) confidence*
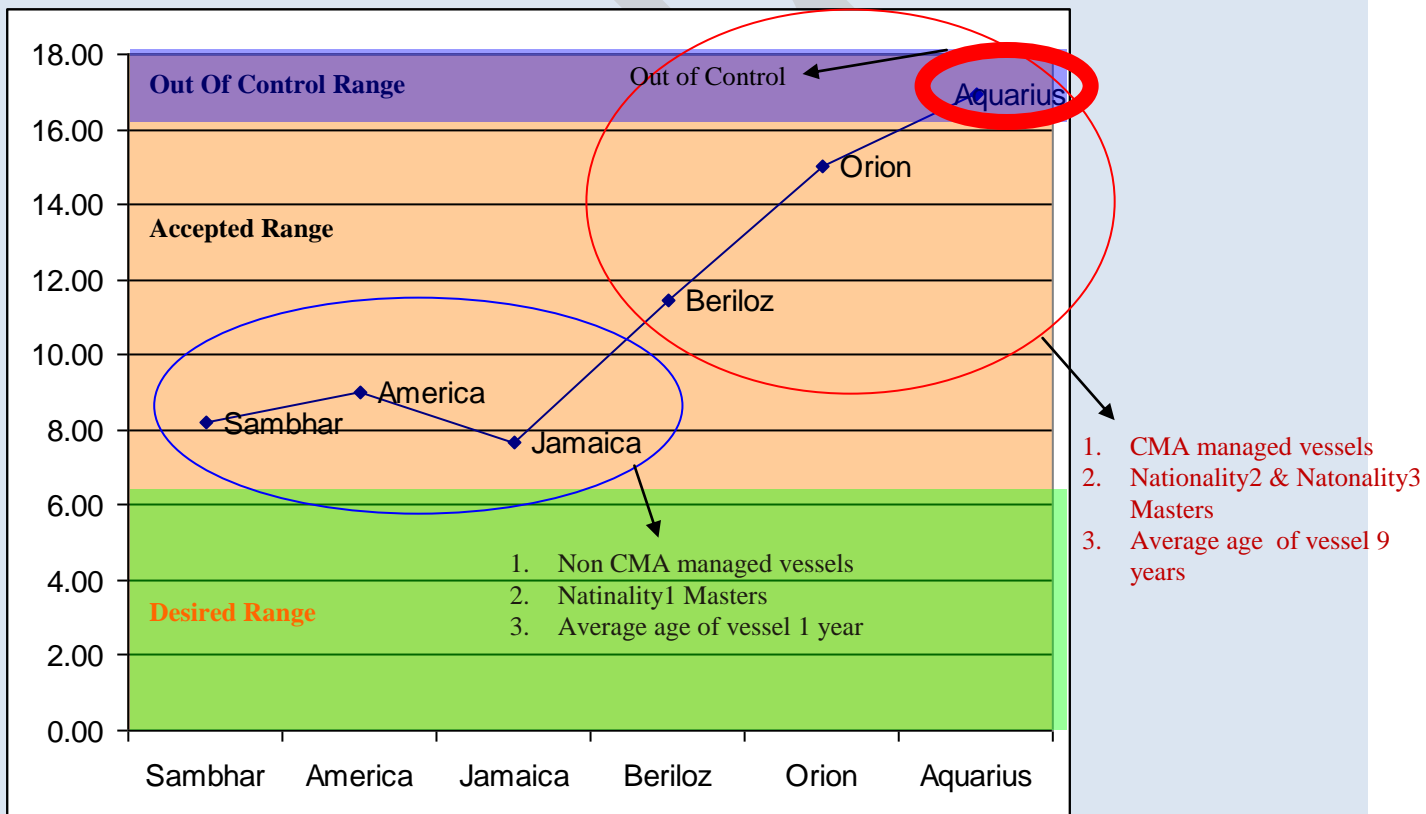
Graph:

Fig – 1

Inference:

1. All 3 non CMA CGM managed vessels are in better condition

2. Only Aquarius is in "Unaccepted" range

3. If immediate actions are not taken then Orion will soon go into "Unaccepted" range

4. Age of vessel is making some difference

5. Nationality1 masters keep a better control

6. Nationality3 masters are not maintaining good control

Process Capability Ratio (C_p):

$$C_P = \text{(Upper limit-Lower Limit)/ 6 * SD}$$

From calculation above we found: $C_P = 1$, which means, quality process is still in the tolerance zone, but at the edge. The moment C_P is less than one, then it will be outside the tolerance zone.

Prologue:

This is suggested an immediate implementation of a strong, reliable and good on board management system to improve the performance of vessels and create market values. Out of my personal experience, Advance Performance Management System could be implemented on board. This is a brain child of Capt. Ib Fruergaard (Founder: IBFC; Ex-MD: A.P. Moller, Singapore) and a time tested system.

NOTE: The real nationality is kept confidential to avoid hurting anyone's identity.