Improving maintenance management "**key processes**" for potential savings

"making money in a tough market"

Tank Operator 19th September 2012

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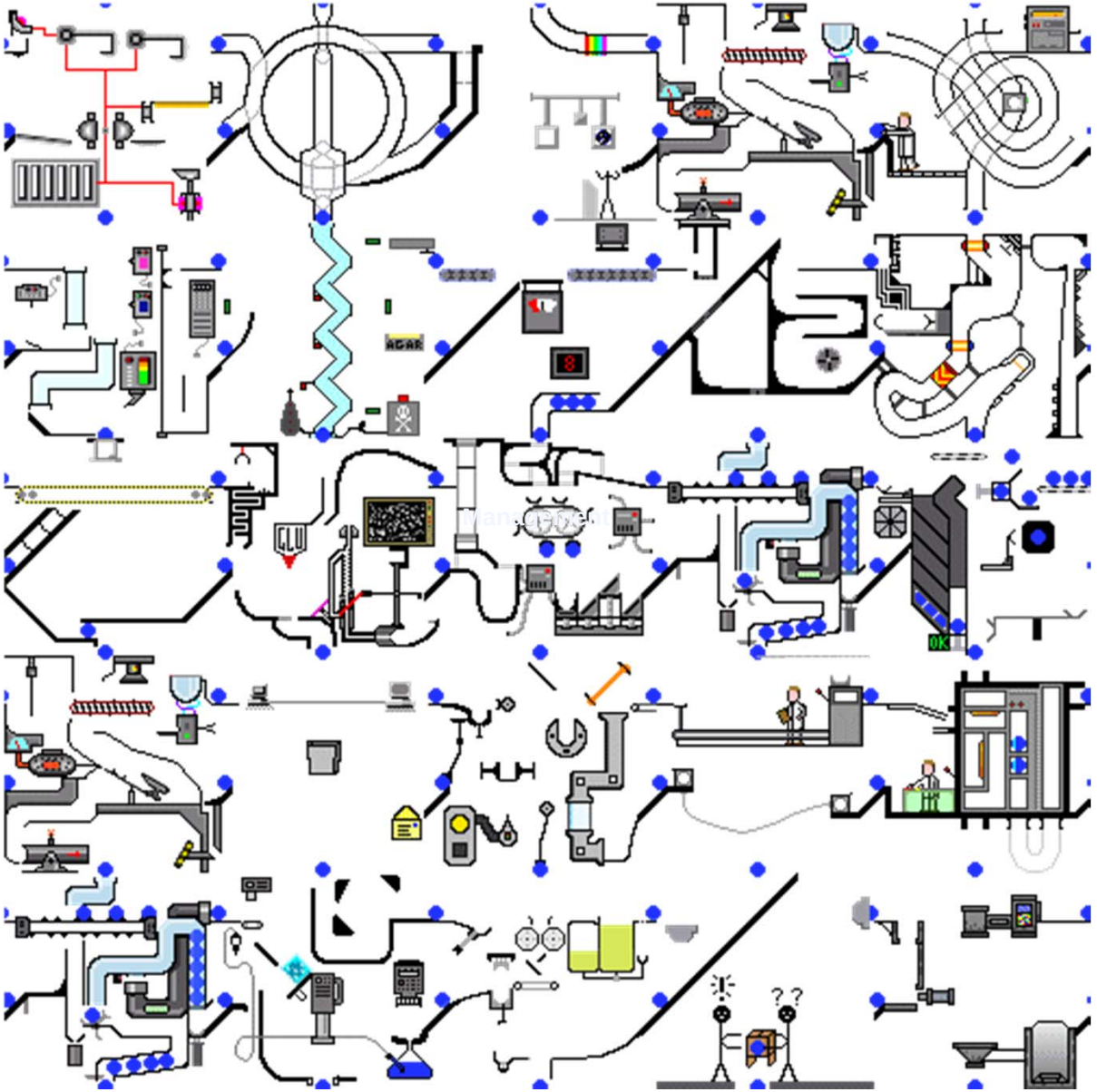
Performance Management Elements



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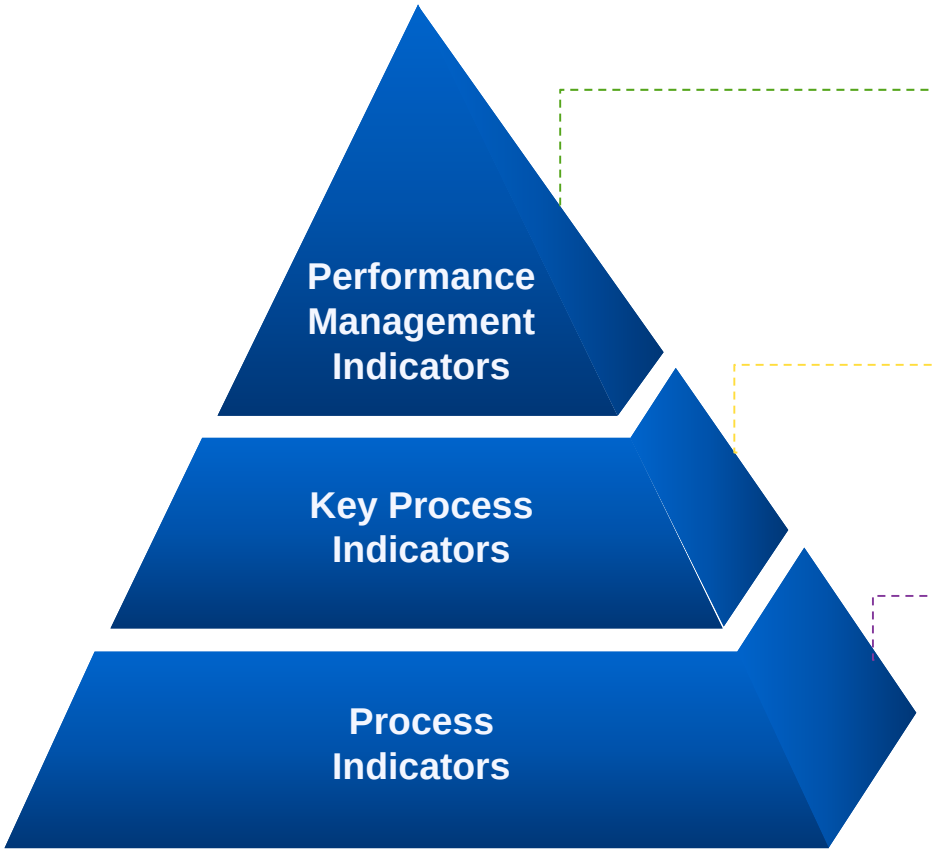
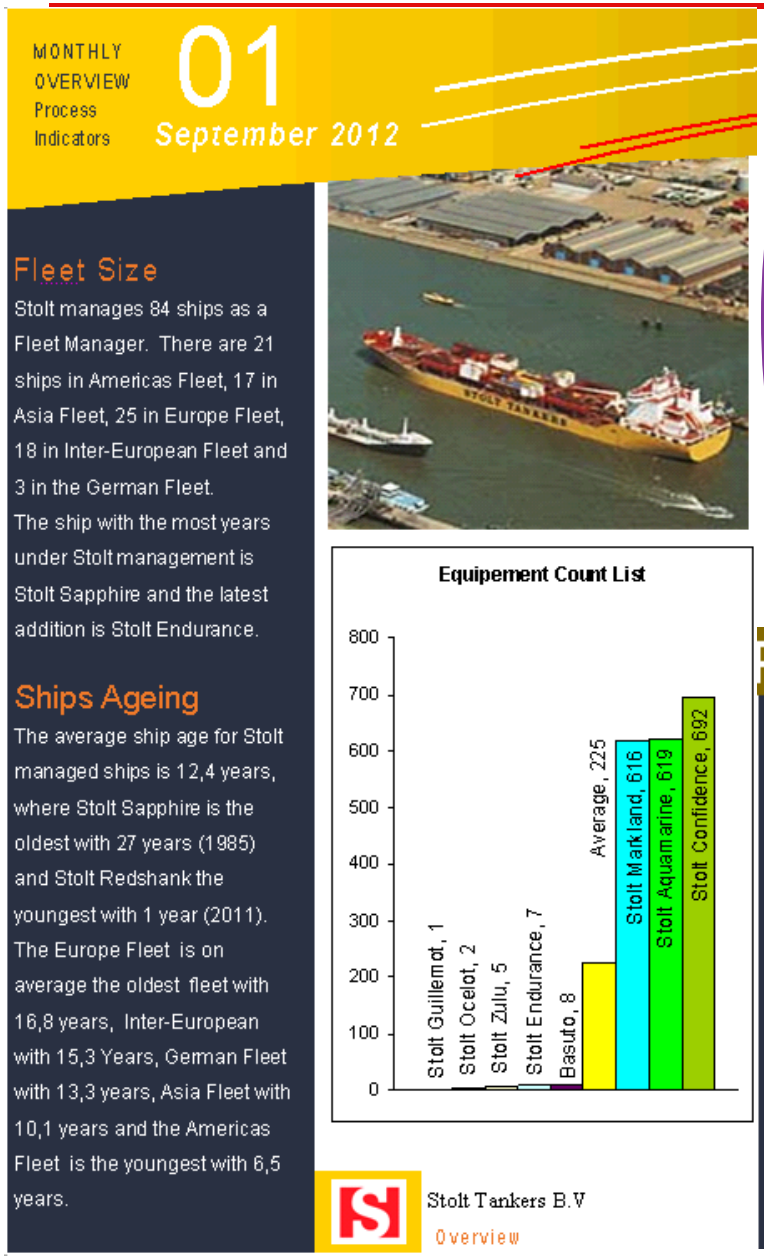


Performance Management Indicators (PMI's) is a process for collecting and reporting information regarding the performance of an individual, group or organizations. It can involve looking at process/strategies in place, as well as whether outcomes are in line with what was intended or should have been achieved

Key performance indicators (KPI's) define a set of values used to measure against. These raw sets of values, which are fed to systems in charge of summarizing the information, are called indicators.

Process Indicators (PI's) "A quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect changes connected to an intervention, or to help assess the performance of a development actor"

Process Indicators (PI's) Example



Process Indicators (PI's) "A quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect changes connected to an intervention, or to help assess the performance of a development actor"

$$PI_k = \sum e_j,$$

Where

PI_k is the kthe Process Indicator and

e_j is the jth event the contributes to the process indicator

Examples PI's

Nr.	PI	PI Value	Process	Definition
157	Crew Training matrix by license	list of crew certificates based on rank	Crew Planning	list of crew trainings based on rank
158	Crew Training matrix by training	list of crew trainings based on rank	Crew Planning	list of crew trainings based on rank
159	Inactive Crew	List of crew memnbers reired, fired, etc per year	Crew Planning	List of inactive crew along with reasons for inactivating
160	Crew Sailing Time	Total sailing time per crew	Crew Planning	To give the total sailing time(irrespective of stolt experience) in YY/MM/DD
161	Crew Sailing time in stolt	Total sailing time in stolt per crew	Crew Planning	To give the total sailing time of stolt ecxperience in YY/MM/DD
162	Crew sailing time per ship class(type)	Crew experience per ship class(type)	Crew Planning	To give the crew sailing experience per ship class(type). For e.g. D37, I20 etc
163	Crew Sailing time per vessel type group	Crew experience per vessel type group	Crew Planning	To give the crew sailing experience per vessel type group (For e.e Chemical Tankers etc)
164	Crew Sailing time per vessel	Crew experience per vessel	Crew Administrattion	To give the crew sailing experience per vessel
165	Crew experience per Rank	Number of years of crew experience in a Rank	Crew Administrattion	To give the number of years of crew experience per crew per rank
166	List of Crew with Medical restrictions	List the crew with Medical restrictions and the type of restriction	Crew Administrattion	To give the crew details having medical restrictions along with the type of restriction
167	Crew age per ship	List the age of crew per ship	Crew Administrattion	To capture the crew details along with the age of the crew members onboard ship
168	SMT age per ship	List the age of SMT per ship	Crew Administrattion	To capture the age of Ship Management team for each ship
169	Crew Non conformity for training	List the non conformities with respect to Trainings per rank of the crew	Crew Administrattion	To capture the non conformities of crew based on the Training-Rank matrix
170	Crew Non conformity for License(certificate)	List the non conformities with respect to License(certificates) per rank of the crew	Crew Administrattion	To capture the non conformities of crew based on the Certificate-Rank matrix
171	Medical Visits	Number of Medical visits daily	Crew Administrattion	List the number of medical visits daily for the crew

Requisitions from last 12 Months:

The number of requisitions received was 39,951.

- America Fleet 10,095
- Asia Fleet 7,784
- Europe Fleet 13,647
- Inter-Europe Fleet 8,425

PO's from last 12 Months:

A total of 21,688 PO's for Consumables and 9,953 PO's for Spare Parts were issued.

Invoices from last 12 Months:

In the running YTD 67,815 Invoices were processed.

Key Process Indicators

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http://sharepoint.stolt.com:5337/SitePages/Home.aspx

Lost Time Injury Frequency	The number of Lost Time Injuries (LTI) per unit exposure hours (OCIMF). Exposure hours are 24 hours per day while serving onboard. Note that injuries during spare-time on board are also included. LTI is the sum of Fatalities, Permanent Total Disabilities, Permanent Partial Disabilities and Lost Workday Cases. Measured per calendar year. Measured per vessel for internal improvement as well as external communication. This KPI represents a ratio between Lost Time Injuries (fatalities, lost workday cases and permanent total and partial disabilities) against the total exposure hours. The measurement unit for the KPI value is incidents per million hour exposure.	F - Fatalities due to injuries LWC - Lost workday cases PTD - Permanent Total Disabilities PPD - Permanent Partial Disabilities TEH - Total exposure hours $\frac{F + LWC + PTD + PPD}{TEH \cdot 10^{-6}}$

Key Process Indicators

- The KPI's are calculated from the PI's and standardized to a value ranging from 0-100%.

- 100% is the value for the best possible performance.

Company Performance

RYTD	Contribution									
KPI	Ship1	Ship2	…	Ship 84	Supfleet1	…	Supfleet25	Fleet1	…	Fleet4	Company
KPI1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%
KPI2	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%
KPI3	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%
…	…	…	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…	…
KPIn-3	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%
KPIn-1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%
KPIn	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%	1-1	1-100%	1-100%

PMI calculation on Company Performance Management

The KPI is multiplied by the factor that controls the Performance, the total KPI contribution is summed and divided by sum of the factors (Normalization).

The resulting value (Bottom) is colored Red if it is under the target and green otherwise.

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Company Performance Management																	
		Environmental		Sea Personnel		Navigational		Operational		Safety		Security		Technical		Energy	
		Target%	80	Target%	70	Target%	95	Target%	60	Target%	90	Target%	70	Target%	80	Target%	50
KPI	Company	Factor	KPI	Factor	KPI	Factor	KPI	Factor	KPI	Factor	KPI	Factor	KPI	Factor	KPI	Factor	KPI
KPI1	80	3	240	1	80	1	80	1	80					1	80		
KPI2	80			1	80	3	240	3	240	1	80			1	80		
KPI3	80			3	240	3	240			3	240			1	80		
…	80							1	80					3	240	1	80
…	80	1	80							3	240					3	240
…	80							1	66			3	240				
…	80			3	240									3	240		
…	80	3	240											1	80	3	240
…	80			1	80	1	80	3	240								
KPIn-3	80									1	80	3	240				
KPIn-2	80	1	80											3	240		
KPIn	80	1	80													3	240
PMI resul		9	80	9	80	8	80	9	78	8	80	6	80	13	80	10	80

Normalization of PMIs, based on the linked KPIs

$$PMI_n = \left(\left(\left(\sum_i [f_i . KPI_i] \right) / \sum_i f_i \right) / T_n - 1 \right)$$

Where

PMI_n is the nth Performance Indicator,

T_n is the nth Target that belongs to it,

KPI_i is the i - th Key Process Indicator that contributes to the PMI,

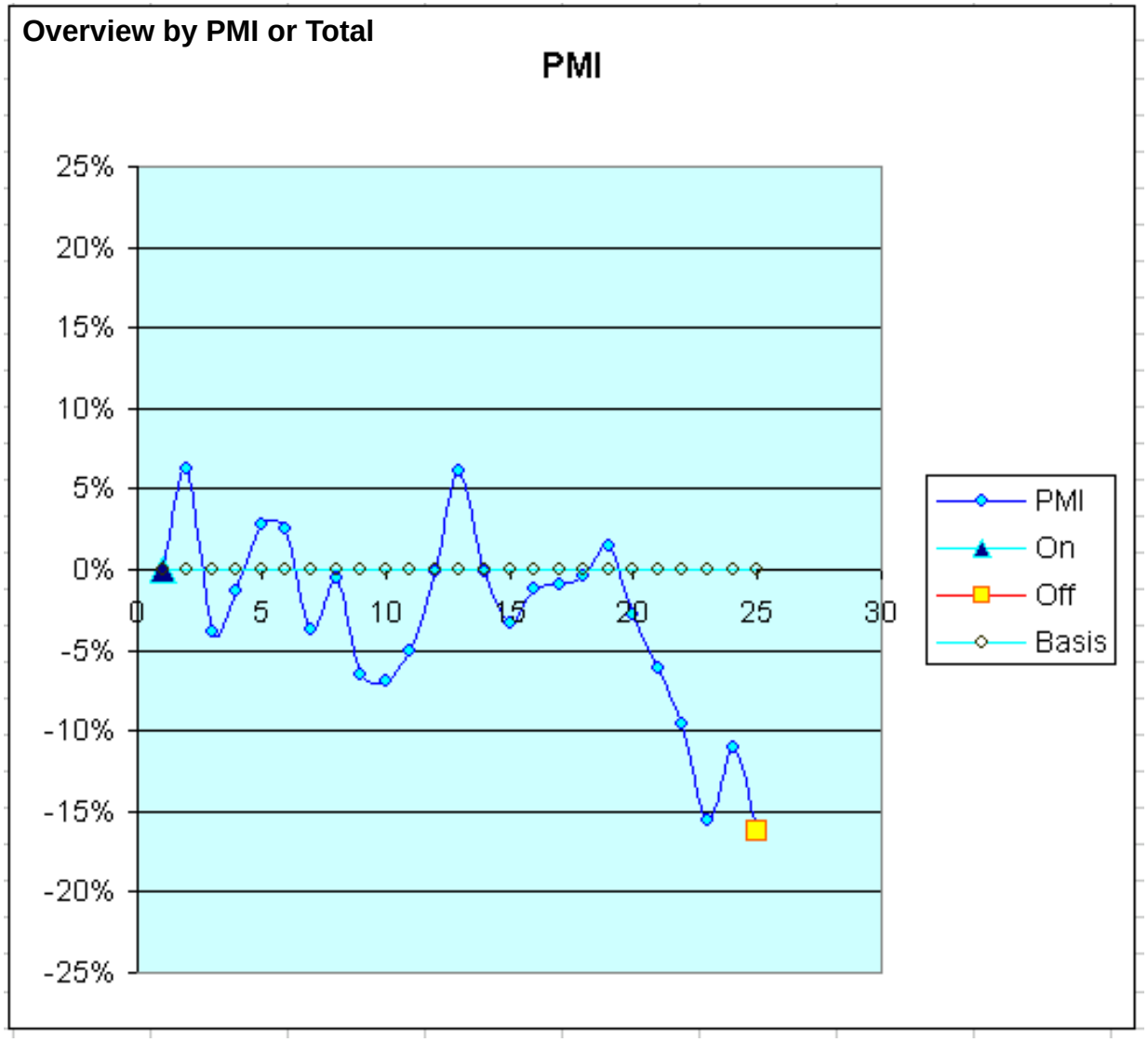
f_i is the weight factor i of the KPI to the PMI

Performance Management Indicators Visual Result

Performance Area	Target	External Performance	Internal Management
Environmental	70%		
Sea Personnel	70%		
Navigational	98%		
Operational	70%		
Safety	90%		
Security	90%		
Technical	80%		
Energy	60%		

A Green border indicates that the Performance is above or under Target; Red border means the performance is under target. The arrow indicates the last RC (Tangent)

Performance Tracking



“**key processes**” for potential savings….

- Compliance, better online overview focus on problems with less administrative cost for events as Near Miss, Accidents/Loss, Non-Conformities, Condition of Class and Audits or Inspections.
- Customer relation, vetting results improvement sharing lessons learn supporting setting ship self assessment check list
- Streamline administrative: processes, documents management, single point thru
- Quantify processes cost, allow to improve support activities reducing cost (e.g. invoice handling, Procurement within contract manager)
- Increased agility, more rapid innovation with process and organization, as ship systems “condition monitoring” with managing direct and simple routine task.
- Just in time supply, improve Material forecast minimizing assets inventory
- Insurance Management, close monitoring of P&I Claims (Medical, Particulars, Cargo)

“**key processes**” for potential savings

Thank You