The Shipping KPI Standard
V2.0

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# Shipping KPI Standard

## Table of Contents

1. **Concepts** .......................................................................................................................... 6
   1.1 Hierarchy of indicators .................................................................................................. 6
   1.2 Shipping Performance Indicators (SPI) ......................................................................... 6
   1.3 Key Performance Indicators (KPI) ................................................................................ 7
   1.4 Performance Indicators (PI) .......................................................................................... 7
   1.5 KPI Depository ............................................................................................................. 8

2. **Shipping Performance Indexes** .......................................................................................... 9
   2.1 Environmental Performance .......................................................................................... 9
   2.2 Health and Safety Management and Performance .......................................................... 9
   2.3 HR Management Performance .................................................................................... 10
   2.4 Navigational Safety Performance ................................................................................ 10
   2.5 Operational Performance ............................................................................................. 10
   2.6 Security Performance .................................................................................................. 11
   2.7 Technical Performance ................................................................................................ 12

3. **Key Performance Indicators** ............................................................................................... 13
   3.1 Ballast water management violations .......................................................................... 13
   3.2 Budget performance .................................................................................................... 15
   3.3 Cadets per vessel ......................................................................................................... 17
   3.4 Cargo related incidents ................................................................................................ 17
   3.5 CO2 efficiency ............................................................................................................ 21
   3.6 Condition of class ...................................................................................................... 23
   3.7 Contained spills .......................................................................................................... 25
   3.8 Crew disciplinary frequency ....................................................................................... 27
   3.9 Crew planning ............................................................................................................. 29
   3.10 Drydocking planning performance ........................................................................... 31
   3.11 Environmental deficiencies ...................................................................................... 33
   3.12 Failure of critical equipment and systems ................................................................. 35
   3.13 Fire and Explosions .................................................................................................. 37
   3.14 Flawless Port State Control performance .................................................................. 39
   3.15 Health and Safety deficiencies ................................................................................... 41
   3.16 HR deficiencies ........................................................................................................ 43
   3.17 Lost Time Injury Frequency ....................................................................................... 45
3.18 Lost Time Sickness Frequency .................................................................47
3.19 Navigational deficiencies.................................................................49
3.20 Navigational incidents ................................................................51
3.21 NOx efficiency ..................................................................................53
3.22 Officer retention rate ........................................................................55
3.23 Officers experience rate ....................................................................57
3.24 Operational deficiencies .................................................................59
3.25 Passenger injury ratio .........................................................................61
3.26 Port state control deficiency ratio ..................................................63
3.27 Port state control detention ..............................................................65
3.28 Releases of substances as def by MARPOL Annex 1-6 .....................67
3.29 Security deficiencies ........................................................................69
3.30 SOx efficiency ..................................................................................71
3.31 Training days per officer ...................................................................73
3.32 Vessel availability .............................................................................75
3.33 Vetting deficiencies ...........................................................................77
4 Performance Indicators ........................................................................79
4.1 Actual drydocking costs .................................................................79
4.2 Actual drydocking duration .............................................................80
4.3 Actual unavailability ........................................................................81
4.4 Agreed drydocking costs .................................................................82
4.5 Agreed drydocking duration .............................................................83
4.6 Average number of officers employed ...........................................84
4.7 Emitted mass of CO2 .........................................................................85
4.8 Emitted mass of NOx ........................................................................87
4.9 Emitted mass of SOx ..........................................................................89
4.10 Last year’s AAE (Additional Authorized Expenses) ......................90
4.11 Last year’s actual running costs and accruals ..................................91
4.12 Last year’s running cost budget ......................................................92
4.13 Number of absconded crew ...........................................................93
4.14 Number of allisions ..........................................................................94
4.15 Number of ballast water management violations .........................95
4.16 Number of beneficial officer terminations ......................................96
4.17 Number of cadets under training with the ship manager ..............97
4.18 Number of cargo related incidents ..................................................98
4.19 Number of cases where a crew member is sick for more than 24 hours .................... 99
4.20 Number of cases where drugs or alcohol is abused ................................................. 100
4.21 Number of charges of criminal offences ................................................................. 101
4.22 Number of collisions ............................................................................................. 102
4.23 Number of conditions of class ............................................................................. 103
4.24 Number of contained spills of bulk liquid .............................................................. 104
4.25 Number of crew not relieved on time ..................................................................... 105
4.26 Number of dismissed crew ..................................................................................... 106
4.27 Number of environmental related deficiencies ....................................................... 107
4.28 Number of explosion incidents .............................................................................. 108
4.29 Number of failures of critical equipment and systems ............................................ 109
4.30 Number of fatalities due to injuries ........................................................................ 110
4.31 Number of fatalities due to sickness ....................................................................... 111
4.32 Number of fire incidents ........................................................................................ 112
4.33 Number of groundings ........................................................................................... 113
4.34 Number of health and safety related deficiencies ................................................... 114
4.35 Number of HR related deficiencies ........................................................................ 115
4.36 Number of logged warnings ................................................................................... 116
4.37 Number of lost workday cases ............................................................................... 117
4.38 Number of navigational related deficiencies .......................................................... 118
4.39 Number of officer days onboard all vessels under technical management (DOC)... 119
4.40 Number of officer experience points ..................................................................... 120
4.41 Number of officer terminations from whatever cause .......................................... 121
4.42 Number of officer trainee man days ....................................................................... 122
4.43 Number of officers onboard ................................................................................... 123
4.44 Number of operational related deficiencies ............................................................ 124
4.45 Number of passengers injured ............................................................................... 125
4.46 Number of permanent partial disabilities ............................................................... 126
4.47 Number of permanent total disabilities (PTD) ....................................................... 127
4.48 Number of PSC deficiencies .................................................................................. 128
4.49 Number of PSC inspections .................................................................................. 129
4.50 Number of PSC inspections resulting in a detention ................................................ 130
4.51 Number of PSC inspections resulting in zero deficiencies ..................................... 131
4.52 Number of recorded external inspections ............................................................... 132
4.53 Number of releases of substances covered by MARPOL, to the environment........... 133
4.54 Number of security related deficiencies ................................................................. 134
4.55 Number of severe spills of bulk liquid ................................................................. 135
4.56 Number of unavoidable officer terminations .................................................... 136
4.57 Number of vessels under technical management (DOC) ...................................... 137
4.58 Number of vetting deficiencies ............................................................................ 138
4.59 Number of vetting inspections .......................................................................... 139
4.60 Number of violations of rest hours ...................................................................... 140
4.61 Passenger exposure hours .................................................................................. 141
4.62 Planned unavailability ......................................................................................... 142
4.63 Total exposure hours ........................................................................................... 143
4.64 Transport work .................................................................................................... 144
1 Concepts
1.1 Hierarchy of indicators

The Shipping KPI Standard is built up hierarchical with 7 Shipping Performance Indexes (SPIs), 34 Key Performance Indicators and 66 Performance Indicators (PIs).

There is a mathematical relation between SPIs (high level indexes) which are calculated from Key Performance Indicators, and KPIs which are calculated from Performance Indicators (lowest level).

On the lowest level you find the PIs, which are based on data capture (measurements or counters) directly from a vessel or from the shipping management. Data is collected once and re-used within the Shipping KPI Standard in order to reduce the amount of data.

On KPI level a form of normalisation take place. The KPI are scaled into a range from 0-100, where zero indicates unacceptable and 100 is outstanding performance. This makes it possible to compare vessels with different characteristics or amount of data captured.

Finally, on the highest level the KPIs are combining into Shipping Performance Indexes in order to express performance within specific main areas.

1.2 Shipping Performance Indicators (SPI)

The Shipping Performance Indexes (SPIs) are aggregated expressions of performance within a particular area. The SPIs are expressed as a weighted average of relevant KPI Ratings on a scale between 0 and 100. Some Key Performance Indicators (KPI) can be included in several SPIs. An example is the KPI Crew Planning which is used in calculation of all SPI Ratings.

The objective of the SPIs is to give external stakeholders information about the overall performance of a vessel in one of the following areas:

- Environmental Performance
- Health and Safety Management and Performance
- HR Management Performance
- Navigational Safety Performance
- Operational Performance
- Security Performance
- Technical Performance
- WebPreferences
1.3 Key Performance Indicators (KPI)

The Key Performance Indicators (KPIs) are expressions of performance within a specific area. The KPI ratings will form basis for the Shipping Performance Index (SPI) score. The KPIs can be expressed in two ways; a KPI Value which is a mathematical combination of relevant Performance Indicators Values and a KPI Rating which is an expression of the KPI Value on scale between 0 and 100 where a high rating (100) is a result of high/excellent performance. Some PI Values can be included in the calculation of more than one KPI Value. Examples of KPIs are: Budget performance, Drydocking planning performance and Vessel availability.

A KPI is:

- a numerical, objective measure of performance
- key to the strategic business objective
- actionable and influenced by the relevant stakeholder/manager
- accountable to stakeholder/manager
- output oriented, not focused on input or activity
- possible to calculate with limited efforts and within limited time

The objectives of KPIs are to:

- measure for continuous improvement
- measure for internal and external benchmarking
- measure to set incentives

1.4 Performance Indicators (PI)

The Performance Indicators (PIs) are the building blocks giving the basis for KPI Value calculations. PIs are directly observable parameters (measurements) for each vessel under management, e.g. Number of dismissed crew, Number of collisions and Number of fire incidents.

The Performance Indicators are the only elements that must be reported manually or by means of implemented ICT solutions. Focus has been to provide the hierarchy with unambiguous definitions of measurable low level parameters based on existing measurements in the industry. Each PI may be used in the calculation of several Key Performance Indicators (KPIs). An example is the PI Number of recorded external inspections which is used as a denominator in the calculation of several KPI Values.
1.5 KPI Depository

The depository contains detailed information about the Shipping KPI Performance Hierarchy through:

1. Description of all Performance Indicators including:
   1. Specification of data capture (PI Values)
   2. Their context in light of how the PI Values are used in the hierarchy
   3. Any intermediate calculation formulas that must be applied to be able to obtain the PI Values
2. Description of all Key Performance Indicators including:
   1. The KPI’s objective (what to measure)
   2. The KPI Value calculation formula
   3. The KPI Rating calculation formula.
3. Description of all Shipping Performance Indexes including:
   1. The SPI’s objective (what to express)
   2. The SPI Rating calculation formula.

The clarification of roles and responsibilities related to the management of the Shipping KPI Depository is under the responsibility of the Project Steering committee until the end of the project, after that InterManager has agreed to take over the maintenance of the Standard. However, the actual work may be contracted to a different organization, and the Shipping KPI Depository may be hosted by a 3rd party provider. The maintenance will at a minimum consist of:

- Updates and enhancements of the web service
- Revision of the SPI/KPI/PI descriptions
- QA support service
- Management of the ICT platform
2 Shipping Performance Indexes

2.1 Environmental Performance

2.1.1 Description
Environmental Performance is an expression of the organisation’s ability to avoid spills and other forms of pollution that impact the environment, caused by the vessel operations. Recorded for each single vessel.
KPIs for emissions (such as CO2-, SOx- and NOx- efficiency) would be highly relevant for this SPI. Until commercial decisions and market situations are taken into account, these KPIs (CO2-, SOx- and NOx- efficiency) remain inconsistent as an expression of the ship managers’ performance. The KPIs are still recorded but not expressed on a SPI level.

2.1.2 Used Key Performance Indicators

<table>
<thead>
<tr>
<th>KPIs used</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Releases of substances as def by MARPOL Annex 1-6</td>
</tr>
<tr>
<td>B: Ballast water management violations</td>
</tr>
<tr>
<td>C: Contained spills</td>
</tr>
<tr>
<td>D: Environmental deficiencies</td>
</tr>
</tbody>
</table>

2.1.3 SPI Rating Formula

\[
SPI = \frac{A + B + C + D}{4}
\]

2.2 Health and Safety Management and Performance

2.2.1 Description
Health and Safety Management and Performance is an expression of the organisation’s ability to effectively manage the health and safety of the personnel onboard. Environmental damage and safety of assets and cargo are covered by different SPIs.
We would also like to include near misses but the challenge here is the reporting and quality of such. Near misses are also considered more leading than lagging and inline with TMSA.

2.2.2 Used Key Performance Indicators

<table>
<thead>
<tr>
<th>Used KPIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Flawless Port state control performance</td>
</tr>
<tr>
<td>B: Lost Time Injury Frequency</td>
</tr>
<tr>
<td>C: Health and Safety deficiencies</td>
</tr>
<tr>
<td>D: Lost Time Sickness Frequency</td>
</tr>
<tr>
<td>E: Passenger Injury Ratio</td>
</tr>
</tbody>
</table>

2.2.3 SPI Rating Formula

\[
SPI = \frac{A + B + C + D + E}{5}
\]
2.3 HR Management Performance

2.3.1 Description
HR Management Performance is an expression of the organisation's ability to employ, retain and develop personnel with the required competences in order to ensure safe and efficient operations of the vessels.

2.3.2 Used Key Performance Indicators

<table>
<thead>
<tr>
<th>Used KPIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Crew disciplinary frequency</td>
</tr>
<tr>
<td>B: Crew planning</td>
</tr>
<tr>
<td>C: HR deficiencies</td>
</tr>
<tr>
<td>D: Cadets per vessel</td>
</tr>
<tr>
<td>E: Officer retention rate</td>
</tr>
<tr>
<td>F: Officers experience rate</td>
</tr>
<tr>
<td>G: Training days per officer</td>
</tr>
</tbody>
</table>

2.3.3 SPI Rating Formula

\[
SPI = \frac{A + B + C + D + E + F + G}{7}
\]

2.4 Navigational Safety Performance

2.4.1 Description
Navigational Safety Performance is an expression of safe navigation and absence of navigational deficiencies.

2.4.2 Used Key Performance Indicators:

<table>
<thead>
<tr>
<th>Used KPIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Navigational deficiencies</td>
</tr>
<tr>
<td>B: Navigational incidents</td>
</tr>
</tbody>
</table>

2.4.3 SPI Rating Formula

\[
SPI = \frac{A + B}{2}
\]

2.5 Operational Performance

2.5.1 Description
Operational Performance is an expression of the operational efficiency of the vessel including passenger care, safe and efficient cargo handling, vessel availability and budget management.*

*Navigation is covered by its own SPI.
2.5.2 Used Key Performance Indicators:

<table>
<thead>
<tr>
<th>Used KPIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Budget performance</td>
</tr>
<tr>
<td>B: Drydocking planning performance</td>
</tr>
<tr>
<td>C: Cargo related incidents</td>
</tr>
<tr>
<td>D: Operational deficiencies</td>
</tr>
<tr>
<td>E: Passenger injury ratio</td>
</tr>
<tr>
<td>F: Port state control detention</td>
</tr>
<tr>
<td>G: Vessel availability</td>
</tr>
<tr>
<td>H: Vetting deficiencies</td>
</tr>
</tbody>
</table>

2.5.3 SPI Rating Formula

\[
SPI = \frac{A + B + C + D + E + F + G + H}{8}
\]

2.6 Security Performance

2.6.1 Description

Security Performance is an expression of the organisation’s ability to manage vessel security.

A new KPI is under consideration and if accepted will be included in this SPI. The KPI is called Security incidents and deals with actual security incidents while the existing KPI called Security deficiencies deals with breaches of security procedures.

2.6.2 Used Key Performance Indicators

<table>
<thead>
<tr>
<th>Used KPIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Flawless Port state control performance</td>
</tr>
<tr>
<td>B: Security deficiencies</td>
</tr>
</tbody>
</table>

2.6.3 SPI Rating Formula

\[
SPI = \frac{A + B}{2}
\]
2.7 Technical Performance

2.7.1 Description

Technical Performance is an expression based on maintenance and reliability.

Two new KPIs are under consideration and if accepted will be included in this SPI. The two KPIs are:

- Planned maintenance
- Technical deficiencies

2.7.2 Used Key Performance Indicators:

<table>
<thead>
<tr>
<th>KPIs used</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Condition of class</td>
</tr>
<tr>
<td>B: Failure of critical equipment and systems</td>
</tr>
</tbody>
</table>

2.7.3 SPI Rating Formula

\[
SPI = \frac{A + B}{2}
\]
3 Key Performance Indicators

3.1 Ballast water management violations

3.1.1 KPI Definition
This KPI expresses the company's ability to adhere to applicable rules and regulations related to management of ballast water, basically the number of times where prevailing regulations regarding management of ballast water have been violated and recorded by an external party.

3.1.2 KPI References
Ballast Water Management Convention.

3.1.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.1.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.1.5 PI used
Number of ballast water management violations

3.1.6 KPI Value Formula
KPI Value = Number of ballast water management violations

3.1.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Ballast water management violations is p.t. set to 1.

KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Ballast water management violations is p.t. set to 0.
3.1.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th>KPI Value</th>
<th>Ballast water management violations</th>
<th>= A = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of ballast water management violations</td>
<td>= 0</td>
</tr>
</tbody>
</table>

3.1.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th>KPI Value</th>
<th>= 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI MinReq</td>
<td>= 1</td>
</tr>
<tr>
<td>KPI Target</td>
<td>= 0</td>
</tr>
</tbody>
</table>

KPI Rating

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{Min Req}}{KPI_{Target} - KPI_{Min Req}} = 100 \times \frac{0 - 0}{0 - 0} = 100 \]

3.1.10 Misc

Sustainability is a key issue within transport. The company should strive towards 100% compliance to applicable rules and regulations related to ballast water.
3.2 Budget performance

3.2.1 KPI Definition
This KPI expresses the company’s ability to effectively plan the ship’s operating costs (e.g. predictable costs, good budgeting). Basically the overall costs deviation (management, purchasing, operation, M&R, crewing) vs. budgets. The cost deviation is adjusted for agreed additional expenditure. The KPI expresses last years’ performance. As the KPI expresses deviations both positive and negative, the KPI Value is always converted to a positive value.

3.2.2 KPI References
No external reference is made for this KPI.

3.2.3 Time Period for data capture and expression of KPI Value and Rating
PI Values should be captured for the previous fiscal year. The actual costs for the full fiscal year cannot be obtained before the completion of that fiscal year. To be able to compare the budget with the actual costs for the same fiscal year, a one year lagging is required for all PI Values. When expressing the KPI Values and Ratings for all quarters in 2009 the time period for the PI Values' capture should be 2008-01-01 to 2008-12-31. All quarters in 2009 will be assigned the same KPI Value.

3.2.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.2.5 PI used
- A: Last year’s running cost budget
- B: Last year’s actual running costs and accruals
- C: Last year’s AAE (Additional Authorized Expenses)

3.2.6 KPI Value Formula

\[ KPI_{Value} = \frac{|A - (B - C)|}{A} \times 100\% \]

3.2.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Budget performance is p.t. set to 10.
**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Budget performance is p.t. set to 2.

### 3.2.8 KPI Value Calculation Example

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Last year’s running cost budget:</td>
<td>= 1.2 M US$</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Last year’s actual running costs and accruals:</td>
<td>= 1.5 M US$</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Last year’s Authorized Additional Expenses (AAE):</td>
<td>= 0.25M US$</td>
</tr>
</tbody>
</table>

KPI Value = \[ \frac{A(B-C)}{A} \times 100\% = \frac{1.2(1.5-0.25)}{1.2} \times 100\% \approx 4.17\% \]

### 3.2.9 KPI Rating Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KPI Value</strong></td>
<td>= 4.17%</td>
</tr>
<tr>
<td><strong>KPI MinReq</strong></td>
<td>= 10%</td>
</tr>
<tr>
<td><strong>KPI Target</strong></td>
<td>= 2%</td>
</tr>
</tbody>
</table>

KPI Rating = \[ KPI_{Rating} = 100 \times \frac{KPI_{Value} \times KPI_{MinReq}}{KPI_{Target} \times KPI_{MinReq}} = 100 \times \frac{417 \times 10}{2 \times 10} = 73 \]

### 3.2.10 Misc

As the result from the complete fiscal year expenses is required to compare them to the budget costs, the concept of expressing KPI Values on basis of the previous fiscal year is introduced. It can be argued that this is an inaccurate expression of performance as the results from the previous year do not necessarily reflect the actual performance in the actual year. This is an understandable view but as the budgets are made for a full fiscal year, simply dividing the budget by four (to get the quarterly budget) is also inaccurate if it where to be used to compare to the actual costs for each quarter. If the company have implemented ‘accrual budgeting’ and do interim book closure quarterly, it would give meaning to do this quarterly, but at this can not be anticipated for all companies the most generally applicable method is to use the full fiscal year and last years budget compared with last years actual cost, from the accounts. In this way we have a proxy for this year’s performance with a time lag. If unexpected circumstances occur giving large deviation in the KPI this should be explained, or may be accounted for in the AAE to avoid penalizing the company for factors not under control of the company, as the intention is to measure the company’s ability to budget, plan and perform according to budget.
3.3 Cadets per vessel

3.3.1 KPI Definition
This KPI expresses the company's efforts to take on new cadets. The KPI shows the ratio between the total number of cadets under training with the Ship Management company over the total number of vessels under technical management (vessels for which the Ship Manager holds the DOC). Basically the average number of cadets per vessel under technical management.

3.3.2 KPI References
InterManager has defined an objective for it's members to hold at least one cadet per vessel under technical management.

3.3.3 Time Period for data capture and expression of KPI Value and Rating
Captured on the last day of the quarter and reported quarterly.
When reporting the PI value for 2009/Q1 the day on which to capture the data should be 2009-03-31.

3.3.4 Vessel/Fleet measurements
This KPI is expressed for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Values, hence the same KPI Value and KPI Rating on this KPI.

3.3.5 PI used
- A: Number of cadets under training with the ship manager
- B: Number of vessels under technical management (DOC)

3.3.6 KPI Value Formula
\[
KPI_{Value} = \frac{A}{B}
\]

3.3.7 KPI Rating Formula
\[
KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}}
\]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Cadets per vessel is p.t. set to 0.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Cadets per vessel is p.t. set to 3.
3.3.8  KPI Value Calculation Example

<table>
<thead>
<tr>
<th>A</th>
<th>Number of cadets under training with the ship manager:</th>
<th>= 123</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Number of vessels under technical management (DOC):</td>
<td>= 134</td>
</tr>
<tr>
<td></td>
<td>KPI Value (Cadets per vessel)</td>
<td>= ( \frac{123}{134} \approx 0.917% )</td>
</tr>
</tbody>
</table>

3.3.9  KPI Rating Calculation Example

| KPI Value | = 0.92 |
| KPI MinReq | = 0 |
| KPI Target | = 3 |

KPI Rating = \( \frac{KPI_{Value} \times KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \) = \( 100 \times \frac{0.924}{3} = 31 \)

3.3.10 Misc
This KPI is in line with the objective of InterManager members to hold at least one cadet per vessel under technical management. We know that there is an issue when it comes to training vessels. What has been argued is that if a ship manager decides to invest in training vessels, the effort should be rewarded by a very positive KPI Value on this KPI.

As this KPI is SBU specific the PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.
3.4 Cargo related incidents

3.4.1 KPI Definition
This KPI expresses the company's ability to contribute to incidents-free cargo operations and carriage.
The KPI counts the number of incidents as recorded in the company’s internal incidents reports.
The KPI includes but is not limited to the following incidents:

- Rejection of vessel or holds/tank prior to loading
- Inability to load full agreed capacity
- Failures/underperformance of ship's cargo equipment
- Negligence by ship's crew resulting in a cargo incident
- Inadequate company and ship board procedures and practices
- Short outturn beyond acceptable level

The KPI excludes the following incidents due to:

- Stevedore/shore staff
- Inherent vice (nature of cargo)
- Shore equipment
- Causes not attributable to the ship
- False declarations by the shipper, etc.
- Force majeure

3.4.2 KPI References
No external reference is made for this KPI.

3.4.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.4.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.4.5 PI used
- A: Number of cargo related incidents

3.4.6 KPI Value Formula

\[ KPI_{Value} = A \]
3.4.7 KPI Rating Formula

\[ KPI_{\text{Rating}} = 100 \times \frac{KPI_{\text{Value}} - KPI_{\text{MinReq}}}{KPI_{\text{Target}} - KPI_{\text{MinReq}}} \]

**KPI MinReq** represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Operational cargo incidents is p.t. set to 2.

**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Operational cargo incidents is p.t. set to 0.

3.4.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th>A</th>
<th>Number of cargo related incidents:</th>
<th>= 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>Cargo related incidents</td>
<td>= 1</td>
</tr>
</tbody>
</table>

3.4.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th>KPI Value</th>
<th>= 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI MinReq</td>
<td>= 2</td>
</tr>
<tr>
<td>KPI Target</td>
<td>= 0</td>
</tr>
</tbody>
</table>

\[ KPI_{\text{Rating}} = 100 \times \frac{KPI_{\text{Value}} - KPI_{\text{MinReq}}}{KPI_{\text{Target}} - KPI_{\text{MinReq}}} = 100 \times \frac{12}{0.2} = 50 \]

3.4.10 Misc

As this KPI should express the ship management organisation’s performance, any accidents where the stevedores accept responsibility are excluded from the calculation.
3.5 CO2 efficiency
3.5.1 KPI Definition
This KPI expresses the energy efficiency of the vessel by comparing emitted mass of CO2 to the vessel’s total transport work. The expression gives the emitted mass of CO2 per ton cargo transported one mile. As the PI Value ‘Emitted Mass CO2’ is to be given in tons, the figure is multiplied by 1 million to get the KPI value in g/transport work (tonmile, passengermile, TEUmile, etc).

3.5.2 KPI References
IMO’s Energy Efficiency Operating Index.

3.5.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.5.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.5.5 PI used
- A: Emitted mass of CO2 [ton]
- B: Transport work [tonmile]

3.5.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \times 10^6 \]

3.5.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Ballast water management violations is p.t. set to 84.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Ballast water management violations is p.t. set to 36.
### 3.5.8 KPI Value Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Emitted mass of CO2:</td>
</tr>
<tr>
<td>B</td>
<td>Transport work:</td>
</tr>
<tr>
<td>KPI Value</td>
<td>CO2 efficiency</td>
</tr>
</tbody>
</table>

### 3.5.9 KPI Rating Calculation Example

| KPI Value | = 5.0 |
| KPI MinReq | = 84 |
| KPI Target | = 36 |
| KPI Rating | $= \frac{\text{KPI Value}}{\text{KPI MinReq}} \times 100 \times \frac{\text{KPI Target}}{\text{KPI MinReq}} = 100 \times \frac{5.0}{84} \times \frac{36}{36} = 100$ |

### 3.5.10 Misc

Sustainability is a key issue within transport. The company should strive contributing by whichever means available to secure the highest possible energy efficiency on the vessel. The issue of energy efficiency is complicated by the fact that there are several influencing factors. The commercial operator is responsible for utilization of the vessel's capacity hereby affecting the transport work. The other main factor regarding transport work is the market itself. The vessel's attributes such as hull design, engine type (and to some extent age) as well as the load factor for each voyage are all influencing the quantity of emitted mass of CO2.
3.6 Condition of class

3.6.1 KPI Definition
This KPI expresses the company's ability to avoid conditions of class. The KPI counts the total number of conditions of class issued by class (ref. IACS). All categories of conditions of class are weighted equally.

3.6.2 KPI References
IACS

3.6.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.6.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel which is being reported should have its unique KPI Value and Rating on this KPI.

3.6.5 PI used
- A: Number of conditions of class

3.6.6 KPI Value Formula

\[ KPI_{Value} = A \]

3.6.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Condition of class is p.t. set to 1.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Condition of class is p.t. set to 0.
3.6.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th>Condition of class</th>
<th>KPI Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( A )</td>
<td>( A = 1 )</td>
</tr>
</tbody>
</table>

3.6.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th>KPI MinReq</th>
<th>KPI Target</th>
<th>KPI Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>( = 1 )</td>
<td>( = 0 )</td>
<td>( = 1 \times \frac{1 - \frac{1}{0}}{1} = 0 )</td>
</tr>
</tbody>
</table>

3.6.10 Misc

Condition of class is an indication/confirmation that the vessel is no longer 100% adherent to the class requirement. Even though far from being in danger of loosing its class any condition of class is something to be taken serious and to be avoided where possible. Condition of class is not measured as a ratio because the potential denominator (total no of inspections where CoCs can be stated) is said to be relatively low for all vessels. Counting the total number of condition instead of calculating the ratio allows the indicator to express accumulated performance or severity. Simply measuring the frequency looses this information, and was therefore not pursued.
3.7 Contained spills

3.7.1 KPI Definition
This KPI expresses the company’s ability to avoid spills, not the ability to contain them. The KPI counts the total number of contained spills. Contained spills should cover liquid spills including (but not limited to) cargo and bunkers contained on the vessel. Contained spills in secure areas as engine rooms are not counted, only spills that could have a potential environmental impact if not contained. Total number of spills on deck where nothing goes overboard of bulk liquids which could have had an environmental impact.

3.7.2 KPI References
No external reference is made for this KPI.

3.7.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.7.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.7.5 PI used
- A: Number of contained spills of bulk liquid

3.7.6 KPI Value Formula

\[ KPI_{Value} = A \]

3.7.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

**KPI MinReq** represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Contained spills is p.t. set to 3.
**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Contained spills is p.t. set to 0.
3.7.8 KPI Value Calculation Example

| A | Number of contained spills of bulk liquid | = 2 |
| KPI Value | Contained spills | = A = 2 |

3.7.9 KPI Rating Calculation Example

| KPI Value | = 2 |
| KPI MinReq | = 3 |
| KPI Target | = 0 |

KPI Rating $= KPI_{Rating} = 100 \times \frac{\text{KPI Value} - \text{KPI MinReq}}{\text{KPI Target} - \text{KPI MinReq}} = 100 \times \frac{2 - 3}{0} = 33$

3.7.10 Misc

Sustainability is a key issue within transport. The company should strive towards zero accidental releases of substances defined as dangerous to the environment even though the incident's impact in this case is reduced as the spill is contained onboard the vessel. The KPI is complementary to the KPI 'Accidental releases of substances as def by MARPOL'. Some spills are contained but still represent an incident that should be recorded. No denominator has been proven necessary for benchmarking purposes.
3.8 Crew disciplinary frequency

3.8.1 KPI Definition
This KPI expresses the ability of the management to maintain discipline. The KPI counts the total number of breaches of code of conduct made by the vessel’s crew such as substance abuse, criminal offences and AWOLs. As the number of crew on different vessels varies significantly, total exposure hours onboard the vessel is used as a denominator to enable benchmarking. If one incident caused by the same crew breaches several categories, each breach should be counted individually. The term ‘Crew’ refers to any person being part of the vessel’s complement. (e.g. officers, ratings, cadets, superintendents).

3.8.2 KPI References
No external reference is made for this KPI.

3.8.3 Time Period for data capture and expression of KPI Value and Rating
PI Values should be captured for a one year rolling time period. The KPI Value is to be expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be 2008-04-01 to 2009-03-31.

3.8.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.8.5 PI used
- A: Number of absconded crew
- B: Number of charges of criminal offences
- C: Number of cases where drugs or alcohol is abused
- D: Number of dismissed crew
- E: Number of logged warnings
- F: Total exposure hours

3.8.6 KPI Value Formula

\[ KPI_{Value} = \frac{A+B+C+D+E}{F} \times 24 \times 365 \]

3.8.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Crew disciplinary frequency is p.t. set to 0,02.
**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Crew disciplinary frequency is p.t. set to 0.

### 3.8.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of absconded crew:</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>Number of charges of criminal offences:</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>Number of cases where drugs or alcohol are abused:</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>Number of dismissed crew:</td>
<td>0</td>
</tr>
<tr>
<td>E</td>
<td>Number of logged warnings:</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Total Exposure hours:</td>
<td>90,000</td>
</tr>
</tbody>
</table>

\[
\text{KPI Value: Crew disciplinary frequency} = \frac{A + B + C + D + E}{F} \times 24 \times 365 = \frac{0 + 0 + 0 + 0 + 1}{90,000} \times 24 \times 365 \approx 0.00973
\]

### 3.8.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>KPI Value</th>
<th>KPI MinReq</th>
<th>KPI Target</th>
<th>KPI Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.01</td>
<td>0.02</td>
<td>0</td>
<td>50</td>
</tr>
</tbody>
</table>

### 3.8.10 Misc

Any breach of code of conduct by the crew is a potential liability and should be avoided whenever possible.

It could be argued that logged warnings are in fact a positive measure against crew misbehaviour but it was decided that the warning would in any case be proof of something not being in accordance with the code of conduct.

The question of charges that are subsequently dismissed is avoided; as such the indicator is not 100% accurate in historical perspective. It was decided not to update the indicator in case a charge is dismissed, as this would be difficult to capture. The main reason for maintaining measurement of charges are that this is still a valid proxy for the conformance with code of conduct and to a certain extent expresses the company culture in this respect.
3.9 Crew planning

3.9.1 KPI Definition
This KPI expresses the company’s ability to relieve crew on time as well as avoiding violations of rest hour’s regulations. The KPI counts the number of breaches to prevailing regulations or agreements.

3.9.2 KPI References
No external reference is made for this KPI.

3.9.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.9.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.9.5 PI used
- A: Number of crew not relieved on time
- B: Number of violation of rest hours

3.9.6 KPI Value Formula

\[ KPI_{Value} = A + B \]

3.9.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Crew planning is p.t. set to 15.

KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Crew planning is p.t. set to 0.
3.9.8 **KPI Value Calculation Example**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Number of crew not relieved on time</td>
</tr>
<tr>
<td></td>
<td>= 1.0</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Number of violation of rest hours</td>
</tr>
<tr>
<td></td>
<td>= 2.0</td>
</tr>
<tr>
<td><strong>KPI Value</strong></td>
<td>Crew planning</td>
</tr>
<tr>
<td></td>
<td>= A + B = 1.0 + 2.0 = 3.0</td>
</tr>
</tbody>
</table>

3.9.9 **KPI Rating Calculation Example**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KPI Value</strong></td>
<td>3.0</td>
</tr>
<tr>
<td><strong>KPI MinReq</strong></td>
<td>15.0</td>
</tr>
<tr>
<td><strong>KPI Target</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>KPI Rating</strong></td>
<td>( KPI\text{Rating} = 100 \times \frac{\text{KPIValue} \times \text{KPI\text{MinReq}}}{\text{KPITarget} \times \text{KPI\text{MinReq}}} ) = 100 \times \frac{3.15}{0.15} = 80</td>
</tr>
</tbody>
</table>

3.9.10 **Misc**

A motivated and alert crew is vital to the overall operation of the vessel. Crew being relieved on time as well as getting the required rest is (in addition to other factors not related to crew planning) essential for their motivation and alertness, and therefore also to the performance and safety of the vessel.

This KPI can be said to be a proxy KPI as what we want to express is the crew’s motivation and alertness. These issues are however very difficult to quantify and the result was that measuring the company’s ability in crew planning was selected as the best alternative available. This indicates that we believe that there is a close correlation between the crew planning, work predictability and motivation.
3.10 Drydocking planning performance

3.10.1 KPI Definition
This KPI expresses the company’s ability to plan the drydocking operation (e.g. predictable costs, good budgeting and scheduling). Basically it expresses the percentile deviation from planned costs and duration.

To avoid penalization of ship managers striving towards minimizing time and cost at drydock, any cost or time deviation between 0 and minus 10% is disregarded (to be interpreted as 'according to plan').

As the KPI expresses deviations both positive and negative, the KPI Value is always converted to a positive value.

3.10.2 KPI References
No external reference is made for this KPI.

3.10.3 Time Period for data capture and expression of KPI Value and Rating
PI Values should be captured when the drydocking occurs. If the drydocking ended on 2009-01-24 the quarter for which to report this PI Value should be 2009/Q1. The KPI Value should be expressed in the quarter which the drydocking ended. If no drydocking has been performed during a specific quarter, the KPI Value and Rating for that quarter will be set to ‘No drydocking has taken place’.

3.10.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.10.5 PI used
- A: Agreed drydocking duration
- B: Actual drydocking duration
- C: Agreed drydocking costs
- D: Actual drydocking costs

3.10.6 KPI Value Formula

\[ KPI_{Value} = IF\left(\frac{B}{A} \times 100 > 0 \text{ THEN } \frac{B}{A} \times 100 \text{ ELSE IF } \left(\frac{B}{A} \times 100 < -10 \text{ THEN } \frac{B}{A} \times 100 - 10 \text{ ELSE 0}\right)\right) + IF\left(\frac{C}{D} \times 100 > 0 \text{ THEN } \frac{C}{D} \times 100 \text{ ELSE IF } \left(\frac{C}{D} \times 100 < -10 \text{ THEN } \frac{C}{D} \times 100 - 10 \text{ ELSE 0}\right)\) \]

3.10.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]
**KPI MinReq** represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Drydocking planning performance is p.t. set to 10.

**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Drydocking planning performance is p.t. set to 2.

### 3.10.8 KPI Value Calculation Example

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Agreed drydocking duration:</td>
<td>= 14 days</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Actual drydocking duration:</td>
<td>= 16 days</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Agreed drydocking costs:</td>
<td>= 4M US$</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>Actual drydocking costs:</td>
<td>= 3.9M US$</td>
</tr>
</tbody>
</table>

\[
\text{KPI Value} = \frac{10}{14} = 0.7143 \times 100 = 71.43\%.
\]

### 3.10.9 KPI Rating Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KPI Value</strong></td>
<td>= 14.3%</td>
</tr>
<tr>
<td><strong>KPI MinReq</strong></td>
<td>= 10</td>
</tr>
<tr>
<td><strong>KPI Target</strong></td>
<td>= 2</td>
</tr>
</tbody>
</table>

\[
KPI_{Rating} = \frac{KPI_{Value}}{KPI_{MinReq}} \times \frac{KPI_{Target}}{100} = \frac{14.3}{10} \times \frac{2}{10} = 0.286 
\]

### 3.10.10 Misc

A potential disturbance is that if in general time deviations are larger than cost deviations, this will be dominant. We may have to revert to this when statistical material is available and there may be a need to introduce weighting in the formula.

Discussions were held regarding the penalisation of deviations below plan (spending less money than budgeted or spending less time in drydock than originally planned). To some extent these deviations can be said to be positive but there will be a threshold as to when the deviation would become a problem (such as the vessel being ready for service but no there is no available charterer). This threshold was set to 10%, meaning that any deviation between 0 and minus 10% is regarded as 'according to plan'. This is why the formula for calculation of the KPI Value is so complex. The basic concept is still that if you spend 14 percent less time in drydock than originally planned, the deviation is set to minus 4 and converted to a positive value.
3.11 Environmental deficiencies

3.11.1 KPI Definition
This KPI expresses the company’s environmental performance by measuring environmental related deficiencies recorded during external inspections and audits. The KPI counts the number of environment related deficiencies including any sub standard act, practice or condition of an environmental consequence (local regulations and MARPOL) such as failure in the Oily Water Separator, recorded during external inspections and audits. The number of deficiencies is expressed relative to the total number of external inspections and audits.

3.11.2 KPI References
No external reference is made for this KPI.

3.11.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.11.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.11.5 PI used
- A: Number of environmental related deficiencies
- B: Number of recorded external inspections

3.11.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.11.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Environmental deficiencies is p.t. set to 5.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Environmental deficiencies is p.t. set to 0.
3.11.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Number of environmental related deficiencies:</th>
<th>= 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of recorded external inspections:</td>
<td>= 2</td>
</tr>
<tr>
<td>B</td>
<td>KPI Value Environmental deficiencies</td>
<td>$= \frac{4}{2} = \frac{4}{2} = 2$</td>
</tr>
</tbody>
</table>

3.11.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>KPI Value</th>
<th>KPI MinReq</th>
<th>KPI Target</th>
<th>KPI Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>$KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{2 - 5}{0} = 60$</td>
</tr>
</tbody>
</table>

3.11.10 Misc

This KPI is part of a range of KPIs related to deficiencies that are identified during external inspections. The deficiencies are categorized depending on their nature. The total number of recorded external inspection is used as a denominator in all these KPIs (related to deficiencies) to enable benchmarking between vessels that are subject to an uneven number of external inspection.
3.12 Failure of critical equipment and systems

3.12.1 KPI Definition
This KPI expresses the company’s ability to maintain critical equipment and systems. The KPI counts the number of failures of equipment and systems in the critical list defined in the company’s Safety and Environmental Management System.

3.12.2 KPI References
No external reference is made for this KPI.

3.12.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.12.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.12.5 PI used
- A: Number of failures of critical equipment and systems

3.12.6 KPI Value Formula

\[ KPI_{Value} = A \]

3.12.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Failure of critical equipment and systems is p.t. set to 1.

KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Failure of critical equipment and systems, is p.t. set to 0.
3.12.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th>A</th>
<th>Number of failures of critical equipment and systems:</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>Failures of critical equipment and systems</td>
<td>A = 1</td>
</tr>
</tbody>
</table>

3.12.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th>KPI Value</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI MinReq</td>
<td>1</td>
</tr>
<tr>
<td>KPI Target</td>
<td>0</td>
</tr>
<tr>
<td>KPI Rating</td>
<td>(KPI_{\text{Rating}} = 100 \times \frac{\text{KPI Value} - \text{KPI MinReq}}{\text{KPI Target} - \text{KPI MinReq}} = 100 \times \frac{1 - 1}{0 - 1} = 0)</td>
</tr>
</tbody>
</table>

3.12.10 Misc

One of the main responsibilities of the ship manager is to ensure that the vessel and its critical equipment and sub-systems are operational at all times (excluding planned unavailability as agreed with the client).

As the vessels’ critical lists may vary in size it could be argued that e.g. the number of items on the list could be used as a denominator for benchmarking purposes. In any case, a failure to a critical equipment or system is a serious matter, regardless of the number of items in the vessel’s critical list, and the KPI ‘Failure to critical equipment and systems is kept without a denominator.'
3.13 Fire and Explosions
3.13.1 KPI Definition
This KPI expresses the company's ability to avoid fire and explosions onboard the vessel. The KPI counts the number of fire and explosion incidents as reported in the company's internal incident reports.

3.13.2 KPI References
No external reference is made for this KPI.

3.13.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.13.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.13.5 PI used
- A: Number of fire incidents
- B: Number of explosion incidents

3.13.6 KPI Value Formula

\[ KPI_{Value} = A + B \]

3.13.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Fire and Explosions is p.t. set to 1.

KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Fire and Explosions is p.t. set to 0.
3.13.8 KPI Value Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of fire incidents:</td>
</tr>
<tr>
<td>B</td>
<td>Number of explosion incidents:</td>
</tr>
<tr>
<td>KPI Value</td>
<td>Fire and Explosions</td>
</tr>
</tbody>
</table>

3.13.9 KPI Rating Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>= 1</td>
</tr>
<tr>
<td>KPI MinReq</td>
<td>= 1</td>
</tr>
<tr>
<td>KPI Target</td>
<td>= 0</td>
</tr>
<tr>
<td>KPI Rating</td>
<td>= ( KPI_{Rating} = \frac{KPI_{Value}}{KPI_{Target}} \times \frac{KPI_{MinReq}}{KPI_{MaxReq}} = \frac{1}{1} \times \frac{1}{1} = 0 )</td>
</tr>
</tbody>
</table>

3.13.10 Misc

Fire and explosion incidents are serious threats to the crew, the vessel and its operation and should be accounted for. In cases where the incident is due to an external cause which the company can not be accountable for, this indicator will penalize somewhat unfair. Even so it was decided to keep the indicator as is. This means that the indicator carries some inherent measure of the trade and area in which the vessel operates, as this influence the likelihood for such an incident.
3.14 Flawless Port State Control performance

3.14.1 KPI Definition
This KPI expresses the company’s Port State Control Performance. The KPI counts the number of times where Port State Control Inspections are conducted without any deficiency being reported and divides this number by the total number of Port State Control Inspections conducted during the same period.

3.14.2 KPI References
No external reference is made for this KPI.

3.14.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.14.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.14.5 PI used
- A: Number of PSC inspections resulting in zero deficiencies
- B: Number of PSC inspections

3.14.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.14.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Flawless Port State Control performance is p.t. set to 0.33.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Flawless Port State Control performance is p.t. set to 1.
3.14.8 KPI Value Calculation Example

| A | Number of PSC inspections resulting in zero deficiencies: | = 2 |
| B | Number of PSC inspections: | = 4 |
| **KPI Value** | Flawless Port State Control performance | \( \frac{4}{4} = 0.5 \) |

3.14.9 KPI Rating Calculation Example

| KPI Value | 0.5 |
| KPI MinReq | 0.33 |
| KPI Target | 1 |
| **KPI Rating** | \( KPI_{Rating} = 100 \times \frac{KPI_{Value} \times KPI_{MinReq}}{KPI_{Target} \times KPI_{MinReq}} = 100 \times \frac{0.5}{1 \times 0.33} = 25 \) |

3.14.10 Misc

This KPI is one of three KPIs related to Port State Control Inspections. The three areas covered are: 'Port state control deficiency ratio' which measures the ratio of the total number of issued deficiencies during port state control inspection against the total number of port state control inspections conducted, 'Port state control detention' which measures the total number of port state control inspections resulting in a detention and this specific KPI, 'Flawless port state control performance' which measures the percentage of port state control inspections resulting in zero deficiencies.

It could be argued that this specific KPI is overlapping with the KPI 'Port State Control deficiency ratio'. We recognize this view and the latter KPI is kept only as an internal KPI hence not part of any SPI.
3.15 Health and Safety deficiencies

3.15.1 KPI Definition
This KPI expresses the company's ability to avoid health and safety related deficiencies recorded during external inspections and audits. The KPI counts the number of health and safety related deficiencies including any sub standard act, practice or condition (such as misplaced life buoys or fire hoses) recorded during external inspections and audits. The number of deficiencies is then made relative to the total number of external inspections.

3.15.2 KPI References
ILO Conventions.

3.15.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.15.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.15.5 PI used
- A: Number of health and safety related deficiencies
- B: Number of recorded external inspections

3.15.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.15.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Health and Safety deficiencies is p.t. 5.

KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Ballast water management violations is p.t. 0.
3.15.8 KPI Value Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of health and safety related deficiencies:</td>
</tr>
<tr>
<td>B</td>
<td>Number of recorded external inspections:</td>
</tr>
</tbody>
</table>
| KPI Value | Health and Safety deficiencies | = \( \frac{3}{2} = \frac{3}{2} = 1.5 \)

3.15.9 KPI Rating Calculation Example

| KPI Value | = 1.5 |
| KPI MinReq | = 5 |
| KPI Target | = 0 |
| KPI Rating | \( KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{1.5 - 5}{0.5} = 70 \) |

3.15.10 Misc

This KPI is part of a range of KPIs related to deficiencies that are identified during external inspections. The deficiencies are categorized depending on their nature. The total number of recorded external inspection is used as a denominator in all these KPIs (related to deficiencies) to enable benchmarking between vessels that are subject to an uneven number of external inspection.
3.16 HR deficiencies

3.16.1 KPI Definition
This KPI expresses the company’s HR related performance measured by number of deficiencies recorded during external inspections and audits. The KPI counts the number of HR related deficiencies including any sub standard act, practice or condition (such as lack of compliance to rest hours), recorded during external inspections and audits. The number of deficiencies is then made relative to the total number of external inspections and audits.

3.16.2 KPI References
No external reference is made for this KPI.

3.16.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.16.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.16.5 PI used
- A: Number of HR related deficiencies
- B: Number of recorded external inspections

3.16.6 KPI Value Formula
\[ KPI_{Value} = \frac{A}{B} \]

3.16.7 KPI Rating Formula
\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI HR deficiencies is p.t. 5. KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI HR deficiencies is p.t. 0.
3.16.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Number of HR related deficiencies:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Number of recorded external inspections:</td>
<td>2</td>
</tr>
<tr>
<td>KPI Value</td>
<td>HR deficiencies</td>
<td>( \frac{4}{2} = 2 = 1.5 )</td>
</tr>
</tbody>
</table>

3.16.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th>KPI Value</th>
<th>1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI MinReq</td>
<td>5</td>
</tr>
<tr>
<td>KPI Target</td>
<td>0</td>
</tr>
<tr>
<td>KPI Rating</td>
<td>( KPI_{\text{Rating}} = 100 \times \frac{KPI_{\text{Value}} - KPI_{\text{MinReq}}}{KPI_{\text{Target}} - KPI_{\text{MinReq}}} = 100 \times \frac{1.5 - 5}{0} = 70 )</td>
</tr>
</tbody>
</table>

3.16.10 Misc

This KPI is part of a range of KPIs related to deficiencies that are identified during external inspections and audits. The deficiencies are categorized depending on their nature. The total number of recorded external inspection and audits is used as a denominator in all these KPIs (related to deficiencies) to enable benchmarking between vessels that are subject to an uneven number of external inspection and audits.
3.17 Lost Time Injury Frequency

3.17.1 KPI Definition
This KPI expresses the company's ability to safeguard crew against injuries and fatalities. The KPI counts the number of Lost Time Injuries (LTI) among the crew per million exposure hours. 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. The term 'crew' refers to any person being part of the vessel's complement. (e.g. officers, ratings, cadets, superintendents). The same complement is also used as basis for calculating the Total Exposure Hours.

3.17.2 KPI References
(OCIMF) Marine Injury Reporting Guidelines

3.17.3 Time Period for data capture and expression of KPI Value and Rating
PI Values should be captured for a one year rolling time period. The KPI Value is to be expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be 2008-04-01 to 2009-03-31.

3.17.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.17.5 PI used
- A: Number of fatalities due to injuries
- B: Number of lost workday cases
- C: Number of permanent total disabilities (PTD)
- D: Number of permanent partial disabilities
- E: Total exposure hours

3.17.6 KPI Value Formula

\[ KPI_{Value} = \frac{A + B + C + D}{E \times 10^6} \]

3.17.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Lost Time Injury Frequency is p.t. set to 2.5.
**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).

Target for the KPI Lost Time Injury Frequency is p.t. set to 0,5.

### 3.17.8 KPI Value Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of fatalities due to injuries:</td>
</tr>
<tr>
<td>B</td>
<td>Number of Lost workday cases:</td>
</tr>
<tr>
<td>C</td>
<td>Number of Permanent total disabilities:</td>
</tr>
<tr>
<td>D</td>
<td>Number of permanent partial disabilities:</td>
</tr>
<tr>
<td>E</td>
<td>Number of Total exposure hours:</td>
</tr>
</tbody>
</table>

KPI Value | Lost Time Injury Frequency | $\frac{0+1+0+0}{87600 \times 10^6} \approx 11.41$

### 3.17.9 KPI Rating Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>11.41</td>
</tr>
<tr>
<td>KPI MinReq</td>
<td>2.5</td>
</tr>
<tr>
<td>KPI Target</td>
<td>0.5</td>
</tr>
</tbody>
</table>

KPI Rating  

$$KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{11.41 - 2.5}{0.5 - 2.5} = 0$$

### 3.17.10 Misc

Lost Time Injury Frequency (LTIF) expresses the number of Lost time Injuries per million exposure hours, and is an expression of the frequency of injuries onboard the vessel. The LTIF does not reflect on the severity of injuries.
3.18 Lost Time Sickness Frequency

3.18.1 KPI Definition
This KPI expresses the company’s ability to safeguard crew sickness and fatalities while serving onboard. The KPI counts the cases of sick crew and any fatality due to sickness. Exposure hours are 24 hours per day while serving onboard. The term ‘crew’ refers to any person being part of the vessel's complement. (e.g. officers, ratings, cadets, superintendents). The same complement is also used as basis for calculating the Total Exposure Hours.

3.18.2 KPI References
OCIMF, in the sense that this KPI is based on the same principle as OCIMF’s Lost Time Injury Frequency.

3.18.3 Time Period for data capture and expression of KPI Value and Rating
PI Values should be captured for a one year rolling time period. The KPI Value is to be expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be 2008-04-01 to 2009-03-31.

3.18.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.18.5 PI used
- A: Number of cases where a crew member is sick for more than 24 hours
- B: Number of fatalities due to sickness
- C: Total exposure hours

3.18.6 KPI Value Formula

\[ KPI_{Value} = \frac{A + B}{C \times 10^{-6}} \]

3.18.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

**KPI MinReq** represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Lost Time Sickness Frequency is p.t. set to 2.5.

**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Lost Time Sickness Frequency is p.t. set to 0.5.
### 3.18.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of cases where a crew member is sick for more than 24 hours:</td>
<td>$= 2$</td>
</tr>
<tr>
<td>B</td>
<td>Number of fatalities due to sickness:</td>
<td>$= 0$</td>
</tr>
<tr>
<td>C</td>
<td>Total exposure hours: $= 87600$ (Crew of 10 for 1 year)</td>
<td>$87600 \times 10^6$</td>
</tr>
<tr>
<td></td>
<td><strong>KPI Value</strong> Lost Time Sickness Frequency $= \frac{A+B}{C \times 10^6}$</td>
<td>$\approx 22.83$</td>
</tr>
</tbody>
</table>

### 3.18.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>KPI Value</strong></td>
<td>$= 22.83$</td>
</tr>
<tr>
<td></td>
<td><strong>KPI MinReq</strong></td>
<td>$= 2.5$</td>
</tr>
<tr>
<td></td>
<td><strong>KPI Target</strong></td>
<td>$= 0.5$</td>
</tr>
<tr>
<td></td>
<td><strong>KPI Rating</strong> $= \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \times 100$</td>
<td>$= 0$</td>
</tr>
</tbody>
</table>

### 3.18.10 Misc

Lost Time Sickness Frequency (LTSF) expresses the number of Lost time Sickness cases per million exposure hours, and is an expression of the likelihood for sickness onboard the vessel. The LTSF do not distinguish on severity of sickness and do not measure the level of severity of sickness, it only expresses the likelihood for becoming ill and do not give any categorization of the disease most likely to occur.

LTSF expresses the number of lost time Sickness cases per million exposure hours, and is an expression of the frequency of sickness onboard the vessel. The LTSF does not reflect the severities of the sickness.
3.19 Navigational deficiencies

3.19.1 KPI Definition
This KPI expresses the company's ability to avoid navigational related deficiencies recorded during external inspections and audits. The KPI counts the number of navigational related deficiencies including any sub standard act, practice or condition (such as a mal functioning radar), recorded during external inspections and audits. The number of deficiencies is then made relative to the total number of external inspections.

3.19.2 KPI References
No external reference is made for this KPI.

3.19.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.19.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.19.5 PI used

- A: Number of navigational related deficiencies
- B: Number of recorded external inspections

3.19.6 KPI Value Formula

\[ KPI_{value} = \frac{A}{B} \]

3.19.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Navigational deficiencies is p.t. set to 5.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Navigational deficiencies is p.t. set to 0.
3.19.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of navigational related deficiencies:</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Number of recorded external inspections:</td>
<td>2</td>
</tr>
<tr>
<td>KPI Value</td>
<td>Navigational deficiencies</td>
<td>$\frac{4}{2} = 2$</td>
</tr>
</tbody>
</table>

3.19.9 KPI Rating Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>2</td>
</tr>
<tr>
<td>KPI MinReq</td>
<td>5</td>
</tr>
<tr>
<td>KPI Target</td>
<td>0</td>
</tr>
<tr>
<td>KPI Rating</td>
<td>$KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{2 - 5}{0} = 60$</td>
</tr>
</tbody>
</table>

3.19.10 Misc

This KPI is part of a range of KPIs related to deficiencies that are identified during external inspections. The deficiencies are categorized depending on their nature. The total number of recorded external inspection is used as a denominator in all these KPIs (related to deficiencies) to enable benchmarking between vessels that are subject to an uneven number of external inspection.
3.20 Navigational incidents

3.20.1 KPI Definition
This KPI expresses the company's navigational performance. The KPI counts any navigational incident resulting in a collision, allision or grounding. All incidents are counted regardless of the cause of the incident. Value parameters are used to weight collisions and groundings twice that of allisions.

3.20.2 KPI References
No external reference is made for this KPI.

3.20.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.20.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.20.5 PI used

- A: Number of collisions
- B: Number of allisions
- C: Number of groundings

3.20.6 KPI Value Formula

\[ KPI_{Value} = (2 \times A) + (1 \times B) + (2 \times C) \]

3.20.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

**KPI MinReq** represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Navigational incidents is p.t. set to 1.
**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Navigational incidents is p.t. set to 0.
3.20.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Number of events</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of collisions:</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>Number of allisions:</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>Number of groundings:</td>
<td>0</td>
</tr>
<tr>
<td>KPI</td>
<td>Navigational incidents:</td>
<td></td>
</tr>
</tbody>
</table>

Calculating the KPI Value:

\[KPI = (2 \times A) + (1 \times B) + (2 \times C) = (2 \times 0) + (1 \times 1) + (2 \times 0) = 1\]

3.20.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>1</td>
</tr>
<tr>
<td>KPI MinReq</td>
<td>1</td>
</tr>
<tr>
<td>KPI Target</td>
<td>0</td>
</tr>
</tbody>
</table>

Calculating the KPI Rating:

\[KPI\text{ Rating} = \frac{KPI\text{ Value} - KPI\text{ MinReq}}{KPI\text{ Target} - KPI\text{ MinReq}} = \frac{1 - 1}{0 - 1} = 0\]

3.20.10 Misc

It could be argued that the responsibility of the incident should be taken into account. At the moment any collision, allision or grounding is counted, regardless of whether the ship manager (represented by the captain) is held liable for the incident. As the question of liability can take months and even years to solve a decision was made to count all incidents regardless of liability issues. In this respect this indicator is also influenced by the trade and area in which the vessel operates, as the trade area have a bearing on the likelihood of incidents, congested waters, narrow passes, severe weather etc. In other words the indicator is not purely expressing the navigational performance of the manager.

In the future this KPI could benefit from including navigational near misses. This would need further consideration regarding the inconsistency of reporting and interpreting near misses.
3.21 NOx efficiency

3.21.1 KPI Definition
This KPI expresses the amount of NOx emitted relative to the transport work performed. As the PI Value 'Emitted Mass NOx' is to be given in tons, the figure is multiplied by 1 million to get the KPI value in g/transport work (tonmile, passengermile, TEUmile, etc).

3.21.2 KPI References
The Norwegian Toll and Avgiftsdirektoratet (The Norwegian Customs and Tax department). Document (only available in Norwegian)

3.21.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.21.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.21.5 PI used

- A: Emitted mass of NOx [ton]
- B: Transport work [ton mile]

3.21.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \times 10^6 \]

3.21.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq} \times KPI_{Target} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI NOx efficiency is p.t. set to 2,2.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI NOx efficiency is p.t. set to 0,9.
### 3.21.8 KPI Value Calculation Example

| A | Emitted mass of NOx: | 4700 ton |
| B | Transport work: | 20,710,647,000 ton mile |
| KPI Value | NOx efficiency | \( \frac{4700}{20,710,647,000} \times 10^6 \approx 0.193 \)

### 3.21.9 KPI Rating Calculation Example

| KPI Value | 0.193 |
| KPI MinReq | 2.2 |
| KPI Target | 0.9 |
| KPI Rating | \( 100 \times \frac{KPI_{Value}}{KPI_{MinReq}} - \frac{KPI_{Target}}{KPI_{MinReq}} = 100 \times \frac{0.193}{0.9} = 100 \) |

### 3.21.10 Misc

The issue of NOx efficiency is complicated by the fact that there are several influencing factors driving the fuel consumption. The commercial operator is responsible for utilization of the vessel’s capacity hereby affecting the transport work. The other main factor regarding transport work is the market itself. Vessel’s attributes such as hull design, engine type (and to some extent age) as well as the load factor for each voyage are all influencing the NOx efficiency through the amount of fuel burned.
3.22 Officer retention rate

3.22.1 KPI Definition
This KPI expresses the company’s ability to retain officers within the organization. Data is captured by analyzing the employment database four years back in time (to identify officers who have been under contract (‘employed’), two years back in time (to identify the number of officers who are no longer ‘employed’) and finding the average number of officers having been under contract during the last two years (average number of officers ‘employed’).

3.22.2 KPI References
INTERTANKO (interpreted by including higher level of details in definitions)

3.22.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured for a two year rolling time period and KPI Value expressed on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be from 2007-04-01 to 2009-03-31

3.22.4 Vessel/Fleet measurements
This KPI is expressed for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Values, hence the same KPI Value and KPI Rating on this KPI.

3.22.5 PI used
- A: Number of officer terminations from whatever cause
- B: Number of unavoidable officer terminations
- C: Number of beneficial officer terminations
- D: Average number of officers employed

3.22.6 KPI Value Formula

\[ KPI_{Value} = 100\% - \frac{(A-(B+C))}{D} \times 100\% \]

Note: (A-(B+C)) = termination with cause of interest

3.22.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Officer retention rate is p.t. set to 70.
**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Officer retention rate is p.t. set to 95.

### 3.22.8 KPI Value Calculation Example

| A | Number of officer terminations from whatever cause: | = 23 |
| B | Number of unavoidable officer terminations: | = 5 |
| C | Number of beneficial officer terminations: | = 1 |
| D | Average number of officers employed: | = 250 |

**KPI Value**

Officer retention rate: 

\[ \text{Officer retention rate} = 100\% - \left( \frac{A(B+C)}{D} \right) \times 100\% = 100\% - \left( \frac{23(5+1)}{250} \right) \times 100\% = 93.2\% \]

### 3.22.9 KPI Rating Calculation Example

| KPI Value | = 93.2% |
| KPI MinReq | = 70% |
| KPI Target | = 95% |

**KPI Rating**

\[ KPI_{Rating} = 100 \times \frac{KPI\_Value - KPI\_Min\_Req}{KPI\_Target - KPI\_Min\_Req} = 100 \times \frac{93.2 - 70}{95 - 70} = 93 \]

### 3.22.10 Misc

The formula is defined by INTERTANKO Officer Retention Formula. (Corrected) Version 2 Dated 12th March 2008.

Source: The formula is modelled upon the Abelson adjusted turnover rate “Abelson M (1996) Turnover cultures and turnover audits” in Human Resources Management. The formula was adjusted by INTERTANKO to create a retention rate formula, as opposed to a turnover rate formula.

The formula has some limitations as the beneficial termination is a subjective term. The formula is also influenced by acquisitions/sales of vessels. In case the fleet is increased the number of officers will increase and the indicator will improve, and the other way if the fleet is reduced the indicator will deteriorate. This effect is to some extent filtered by using the average number of officers employed in the reporting period.

As officer employment is more contract based in ship management we had to make some clarifications on what ‘termination’ and ‘employment in this context actually mean. These clarifications are not part of INTERTANKO’s Officer Retention Formula.

As this KPI is SBU specific the PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.
3.23 Officers experience rate

3.23.1 KPI Definition
This alternative expresses the percentile experience of the officers currently onboard the vessel on basis of 12 months of experience as 100%.

Each officer currently onboard is assigned experience points according to a predefined scale. The maximum number of experience points per officer is 4 (equals 12 months sailing time with the same ship manager). Any experience above 12 months sailing time is disregarded.

3.23.2 KPI References
No external reference is made for this KPI.

3.23.3 Time Period for data capture and expression of KPI Value and Rating
Captured on the last day of the quarter and reported quarterly.
When reporting the PI value for 2009/Q1 the day on which to capture the data should be 2009-03-31.

3.23.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.23.5 PI used

- A: Number of officer experience points
- B: Number of officers onboard

3.23.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{4 \times B} \]

3.23.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Officers experience rate is p.t. set to 60.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Officers experience rate is p.t. set to 90.
3.23.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Number of officer experience points:</th>
<th>= 34</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Number of officers onboard:</td>
<td>= 9</td>
</tr>
<tr>
<td>KPI Value</td>
<td>Officers experience rate</td>
<td>= \frac{34}{9} * 100 = 94.4%</td>
</tr>
</tbody>
</table>

3.23.9 KPI Rating Calculation Example

| KPI Value | = 94.4 |
| KPI MinReq | = 60 |
| KPI Target | = 90 |
| KPI Rating | = \frac{\text{KPI Value} - \text{KPI Min Req}}{\text{KPI Target} - \text{KPI Min Req}} \times 100 = \frac{94.4 - 60}{90 - 60} \times 100 = 100 |

3.23.10 Misc

The importance of having experienced officers onboard should not be underestimated. This indicator measure employment length and is a proxy for competence. It does not measure competence but we believe that if there is a sound culture with in the company there is a correlation between the sailing time and competence both about procedures and on technical equipment and systems.

As any officer with an extensive number of sailing months with the same ship manager would even out any officer with a very limited number of sailing months with the same ship manager, the cut off regarding experience points has been set to 12 months.
3.24 Operational deficiencies

3.24.1 KPI Definition
This KPI expresses the company's ability to avoid operational related deficiencies recorded during external inspections and audits. The KPI counts the number of operational related deficiencies including any sub standard act, practice or condition (not including HR-, security-, health and safety- and environmental deficiencies) recorded during external inspections and audits. The number of deficiencies is then made relative to the total number of external inspections.

3.24.2 KPI References
No external reference is made for this KPI.

3.24.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.24.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.24.5 PI used

- A: Number of operational related deficiencies
- B: Number of recorded external inspections

3.24.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.24.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Operational deficiencies is p.t. set to 5.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Operational deficiencies is p.t. set to 0.
3.24.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Number of operational related deficiencies:</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of recorded external inspections:</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>Operational deficiencies</td>
<td>( \frac{4}{5} = 0.8 )</td>
</tr>
</tbody>
</table>

3.24.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th>KPI Value</th>
<th>0.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI MinReq</td>
<td>5</td>
</tr>
<tr>
<td>KPI Target</td>
<td>0</td>
</tr>
</tbody>
</table>

\[
KPI_{Rating} = \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = \frac{0.2 - 5}{0 - 5} = 0.02 - 5 = 96
\]

3.24.10 Misc

This KPI is part of a range of KPIs related to deficiencies that are identified during external inspections. The deficiencies are categorized depending on their nature. This specific KPI (Operational deficiencies) is a KPI that will cover all deficiencies that are not easily related to one of the other more specific KPIs within this range.

The total number of recorded external inspection is used as a denominator in all these KPIs (related to deficiencies) to enable benchmarking between vessels that are subject to an uneven number of external inspection.
3.25 Passenger injury ratio

3.25.1 KPI Definition
This KPI expresses the company’s ability to safeguard all passengers while onboard. The KPI represents a ratio between the number of injured (including fatalities) passengers reported during embarkation, disembarkation and voyage relative to the passenger exposure hours in the reporting period. By defining the KPI as a ratio, benchmarking is feasible even between different vessel sizes.

Only vessels certified to carry passengers should use this KPI. Note that supernumeraries (family members, riding crew, superintendents and stowaways) are not considered as passengers.

3.25.2 KPI References
No external reference is made for this KPI.

3.25.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.25.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.25.5 PI used
- A: Number of passengers injured
- B: Passenger exposure hours

3.25.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.25.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Passenger Injury Ratio is p.t. set to 2.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Passenger Injury Ratio is p.t. set to 0,2.
3.25.8 KPI Value Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of passengers injured:</td>
</tr>
<tr>
<td>B</td>
<td>Passenger exposure hours:</td>
</tr>
<tr>
<td></td>
<td>KPI Value</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.25.9 KPI Rating Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>50</td>
</tr>
<tr>
<td>KPI MinReq</td>
<td>2</td>
</tr>
<tr>
<td>KPI Target</td>
<td>0.2</td>
</tr>
<tr>
<td>KPI Rating</td>
<td>$KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{50 - 2}{0.2 - 2} = 0$</td>
</tr>
</tbody>
</table>

3.25.10 Misc

One of the main objectives for any ship manager in the passenger industry (cruise or RoPax) is to ensure the passengers' safety. The KPI is an expression of the likelihood of experiencing an injury while being onboard this vessel. The indicator does not take into account the severity of injury, only the likelihood for each passenger.
3.26 Port state control deficiency ratio

3.26.1 KPI Definition
This KPI expresses the company’s ability to avoid deficiencies issued during Port State Control Inspections. The KPI represents a ratio between the number of reported deficiencies relative to the number of Port State Control Inspections, as such the average number of deficiencies per inspection. By defining the KPI as a ratio, benchmarking is feasible even between vessels being subject to an uneven number of Port State Control Inspections.

3.26.2 KPI References
No external reference is made for this KPI.

3.26.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.26.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.26.5 PI used
- A: Number of PSC deficiencies
- B: Number of PSC inspections

3.26.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.26.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Port state control deficiency ratio is p.t. set to 8.

KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Port state control deficiency ratio is p.t. set to 0.
3.26.8 **KPI Value Calculation Example**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Number of PSC deficiencies:</td>
<td>= 12</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Number of PSC inspections:</td>
<td>= 4</td>
</tr>
</tbody>
</table>

**KPI Value**

Port state control deficiency ratio \(= \frac{4}{4} = \frac{12}{4} = 3\)

3.26.9 **KPI Rating Calculation Example**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KPI Value</strong></td>
<td>= 3,0</td>
</tr>
<tr>
<td><strong>KPI MinReq</strong></td>
<td>= 8</td>
</tr>
<tr>
<td><strong>KPI Target</strong></td>
<td>= 0</td>
</tr>
</tbody>
</table>

**KPI Rating**

\(= \frac{\text{KPI Value} - \text{KPI MinReq}}{\text{KPI Target} - \text{KPI MinReq}} \times 100 = \frac{3.0 - 8}{0 - 8} \times 100 = -63\)

3.26.10 **Misc**

This KPI is one of three KPIs related to Port State Control Inspections. The three areas covered are; 'Flawless port state control performance' which measures the percentage of port state controls resulting in zero deficiencies, 'Port state control detention' which measures the total number of port state control inspections resulting in a detention and this specific KPI, 'Port state control deficiency ratio', which measures the ratio of the total number of issued deficiencies during port state control inspection relative to the total number of port state control inspections conducted.
3.27 Port state control detention

3.27.1 KPI Definition
This KPI expresses the ability to complete PSC inspections without incurring a detention (code 30). The KPI is a simple counter of the number of PSC inspections resulting in a detention.

3.27.2 KPI References
IMO
RESOLUTION A.882(21), adopted on 25 November 1999
AMENDMENTS TO THE PROCEDURES FOR PORT STATE CONTROL
(RESOLUTION A.787(19))

3.27.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.27.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.27.5 PI used

- A: Number of PSC inspections resulting in a detention

3.27.6 KPI Value Formula

\[ KPI_{Value} = A \]

3.27.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Port state control detention is p.t. set to 1.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Port state control detention is p.t. set to 0.
3.27.8 KPI Value Calculation Example

| A | Number of PSC inspections resulting in a detention: | = 1 |
| KPI Value | Port state control detention | = A = 1 |

3.27.9 KPI Rating Calculation Example

| KPI Value = 1 |  |
| KPI MinReq = 1 |  |
| KPI Target = 0 |  |
| KPI Rating \( = \frac{\text{KPI Value} - \text{KPI MinReq}}{\text{KPI Target}} \times 100 \times \frac{1}{1} = 0 \) |

3.27.10 Misc

This KPI is one of three KPIs related to Port State Control Inspections. The three areas covered are; 'Flawless port state control performance' which measures the percentage of port state controls resulting in zero deficiencies, 'Port state control deficiency ratio' which measures the ratio of the total number of issued deficiencies during port state control inspection against the total number of port state control inspections conducted and this specific KPI, 'Port state control detention' which measures the total number of port state control inspections resulting in a detention.

Whether this KPI should include the number of port state control inspections as a denominator is debatable and will be considered for later releases. Whether the data should be captured for a one year rolling time period or per quarter is also debatable as well as whether this KPI should be fleet specific.

By aggregating the KPI Values for all vessels in the fleet, taking into account the total number of PSC inspections and the number of vessels in the fleet, the fleet’s detention rate can be obtained.
3.28 Releases of substances as def by MARPOL Annex 1-6

3.28.1 KPI Definition
This KPI expresses the company’s ability to avoid releases of substances as defined by MARPOL (Annex 1-6). This is done by counting (and aggregating) the number of (severe) spills of liquid and releases of substances. A severe spill is a spill above one barrel (42 US gallons or 159 litres).

3.28.2 KPI References
MARPOL. All occurrences of release of substances as defined by MARPOL (Annex 1-6) when released should be counted.

3.28.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.28.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI

3.28.5 PI used
- A: Number of releases of substances covered by MARPOL, to the environment
- B: Number of severe spills of bulk liquid

3.28.6 KPI Value Formula

\[ KPI_{Value} = A + B \]

3.28.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Releases of substances as def by MARPOL Annex 1-6 is p.t. set to 1.

KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Releases of substances as def by MARPOL Annex 1-6 is p.t. set to 0.
3.28.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Number of accidental releases of substances covered by MARPOL, to the environment:</th>
<th>= 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Number of severe spills of bulk liquid:</td>
<td>= 0</td>
</tr>
<tr>
<td>KPI Value</td>
<td>Releases of substances as def by MARPOL Annex 1-6</td>
<td>= A + B = 1 + 0 = 1</td>
</tr>
</tbody>
</table>

3.28.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>KPI Value</th>
<th>= 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI MinReq</td>
<td>= 1</td>
<td></td>
</tr>
<tr>
<td>KPI Target</td>
<td>= 0</td>
<td></td>
</tr>
<tr>
<td>KPI Rating</td>
<td>= (KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{11}{11} = 0)</td>
<td></td>
</tr>
</tbody>
</table>

3.28.10 Misc
Sustainability is a key issue within transport. The company should strive towards zero accidental releases of substances defined as dangerous to the environment.
Due to difficulties in measuring the actual volume/quantity of a spill or release, the KPI focus on the number of incidents. To avoid any confusion regarding when a spill is severe we defined a severe spill as a spill above one barrel (42 US gallons or 159 metric litres). Operational emissions are covered by the KPIs CO2 efficiency, NOx efficiency and SOx efficiency.
3.29 Security deficiencies

3.29.1 KPI Definition
This KPI expresses the ship manager’s security performance measured by the number of deficiencies recorded during external inspections and audits. The KPI counts the number of security related deficiencies including any sub standard act, practice or condition (such as lack of compliance to the ISPS code) recorded during external inspections and audits. The number of deficiencies is then made relative to the total number of external inspections and audits.

3.29.2 KPI References
No external reference is made for this KPI.

3.29.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.29.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.29.5 PI used
- A: Number of security related deficiencies
- B: Number of recorded external inspections

3.29.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.29.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Security deficiencies is p.t. set to 1.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Security deficiencies is p.t. set to 0.
3.29.8 KPI Value Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of security related deficiencies:</td>
</tr>
<tr>
<td></td>
<td>= 3</td>
</tr>
<tr>
<td>B</td>
<td>Number of recorded external inspections:</td>
</tr>
<tr>
<td></td>
<td>= 2</td>
</tr>
<tr>
<td>KPI Value</td>
<td>Security deficiencies</td>
</tr>
<tr>
<td></td>
<td>= ( \frac{4}{2} = 2 ) = 1.5</td>
</tr>
</tbody>
</table>

3.29.9 KPI Rating Calculation Example

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>= 1.5</td>
</tr>
<tr>
<td>KPI minReq</td>
<td>= 5</td>
</tr>
<tr>
<td>KPI Target</td>
<td>= 0</td>
</tr>
<tr>
<td>KPI Rating</td>
<td>= ( KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{minReq}}{KPI_{Target} - KPI_{minReq}} = 100 \times \frac{155}{55} = 70 )</td>
</tr>
</tbody>
</table>

3.29.10 Misc

This KPI is part of a range of KPIs related to deficiencies that are identified during external inspections and audits. The deficiencies are categorized depending on their nature. The total number of recorded external inspection and audits is used as a denominator in all these KPIs (related to deficiencies) to enable benchmarking between vessels that are subject to an uneven number of external inspection and audits.
3.30 SOx efficiency

3.30.1 KPI Definition
This KPI expresses the mass of SOx emitted relative to the transport work performed. As the PI Value 'Emitted Mass SOx is to be given in tons, the figure is multiplied by 1 million to get the KPI value in g/transport work (tonmile, passengermile, TEUmile, etc).

3.30.2 KPI References
No external reference is made for this KPI.

3.30.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.30.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level.
Each vessel should have its unique KPI Value and Rating on this KPI.

3.30.5 PI used
- A: Emitted mass of SOx [ton]
- B: Transport work [tonmile]

3.30.6 KPI Value Formula
\[ KPI_{Value} = \frac{A}{B} \times 10^6 \]

3.30.7 KPI Rating Formula
\[ KPI_{Rating} = 100 \times \frac{KPI_{Value}}{KPI_{Target}} \times \frac{KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]
KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI SOx efficiency is p.t. set to 1.5.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI SOx efficiency is p.t. set to 0.6.
3.30.8 **KPI Value Calculation Example**

| A | Emitted mass of SOx: | = 2000 ton |
| B | Transport work: | = 20,710,647,000 ton mile |
| **KPI Value** | SOx efficiency | \( \frac{A}{B} \times 10^6 = \frac{2000}{20,710,647,000} \times 10^6 \approx 0.097 \) |

3.30.9 **KPI Rating Calculation Example**

| **KPI Value** | = 0.097 |
| **KPI MinReq** | = 1.5 |
| **KPI Target** | = 0.6 |
| **KPI Rating** | \( KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{0.097 - 1.5}{0.6 - 1.5} = 100 \) |

3.30.10 **Misc**

The issue of SOx efficiency is complicated by the fact that there are several influencing factors. The commercial operator is responsible for utilization of the vessel’s capacity hereby affecting the transport work. The other main factor regarding transport work is the market itself. Vessel’s attributes such as hull design, engine type (and to some extent age) as well as the load factor for each voyage are all influencing the quantity of emitted mass of SOx through the amount of fuel burned.
3.31 Training days per officer

3.31.1 KPI Definition
This KPI expresses the company's commitment to maintain and enhance the officers' competence. The KPI represents the ratio between the ship manager's efforts in training over the total number of officer working days. Basically the average number of training days per officer day at sea.

3.31.2 KPI References
No external reference is made for this KPI.

3.31.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis.
When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values' capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.31.4 Vessel/Fleet measurements
This KPI is expressed for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Values, hence the same KPI Value and KPI Rating on this KPI.

3.31.5 PI used
- A: Number of officer trainee man days
- B: Number of officer days onboard all vessels under technical management (DOC)

3.31.6 KPI Value Formula

\[ KPI_{Value} = \frac{A}{B} \]

3.31.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Training days per officer is p.t. 0.
KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Training days per officer is p.t. 0.5.
3.31.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of officer trainee man days:</td>
<td>59</td>
</tr>
<tr>
<td>B</td>
<td>Number of officer days onboard all vessels under technical management (DOC):</td>
<td>4500</td>
</tr>
<tr>
<td>KPI Value</td>
<td>Training days per officer</td>
<td>$\frac{4}{50} = 0.08 \approx 0.013$</td>
</tr>
</tbody>
</table>

3.31.9 KPI Rating Calculation Example

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>= 0.013</td>
<td></td>
</tr>
<tr>
<td>KPI MinReq</td>
<td>= 0</td>
<td></td>
</tr>
<tr>
<td>KPI Target</td>
<td>= 0.5</td>
<td></td>
</tr>
<tr>
<td>KPI Rating</td>
<td>$KPI_{Rating} = 100 \times \frac{KPI_{Value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} = 100 \times \frac{0.0130}{0.50} = 3$</td>
<td></td>
</tr>
</tbody>
</table>

3.31.10 Misc

The ship manager’s effort to maintain and enhance the officers' competence is vital.

As this KPI is SBU specific the PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.
3.32 Vessel availability

3.32.1 KPI Definition
This KPI expresses the company’s ability to minimize the unplanned unavailability. The KPI calculates the vessel utilization as a percentage of the total utilization time available.

3.32.2 KPI References
No external reference is made for this KPI.

3.32.3 Time Period for data capture and expression of KPI Value and Rating
PI Values should be captured for a one year rolling time period. The KPI Value is to be expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be 2008-04-01 to 2009-03-31.

3.32.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.32.5 PI used
- A: Actual unavailability
- B: Planned unavailability

3.32.6 KPI Value Formula

\[ KPI_{\text{value}} = \frac{(24 \times 365 - B) - A}{24 \times 365 - B} \times 100\% \]
(24 x 365 - B) - A = time the charterer is required to pay for

3.32.7 KPI Rating Formula

\[ KPI_{\text{Rating}} = 100 \times \frac{KPI_{\text{Value}} - KPI_{\text{MinReq}}}{KPI_{\text{Target}} - KPI_{\text{MinReq}}} \]

KPI MinReq represents the KPI Value which should result in 0 on the KPI Rating scale (0-100). MinReq for the KPI Vessel availability is p.t. set to 97. KPI Target represents the KPI Value which should result in 100 on the KPI Rating scale (0-100). Target for the KPI Vessel availability is p.t. set to 100.
### 3.32.8 KPI Value Calculation Example

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Actual unavailability:</td>
<td>= 23</td>
</tr>
<tr>
<td>B</td>
<td>Planned unavailability:</td>
<td>= 18</td>
</tr>
<tr>
<td></td>
<td>KPI Value</td>
<td>Vessel availability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$= (1 - \frac{A}{24 \cdot 365 \cdot B}) \times 100% = (1 - \frac{23}{24 \cdot 365 \cdot 18}) \times 100% = 99.74%$</td>
</tr>
</tbody>
</table>

### 3.32.9 KPI Rating Calculation Example

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>KPI Value</td>
<td>= 99.74%</td>
<td></td>
</tr>
<tr>
<td>KPI MinReq</td>
<td>= 97%</td>
<td></td>
</tr>
<tr>
<td>KPI Target</td>
<td>= 100%</td>
<td></td>
</tr>
<tr>
<td>KPI Rating</td>
<td>$= \frac{KPI_{Value} \cdot KPI_{MinReq}}{KPI_{Target} \cdot KPI_{MinReq}} = 100 \times \frac{99.74%}{100%} = 99.7497 \approx 91$</td>
<td></td>
</tr>
</tbody>
</table>

### 3.32.10 Misc

Keeping the vessel available to the client is among the most important responsibilities of the ship manager.

The KPI calculates the vessel utilization as a percentage of the 100% availability which is found by subtracting hours of planned unavailability from 365x24.
3.33 Vetting deficiencies

3.33.1 KPI Definition
This KPI expresses the ship manager’s ability to avoid deficiencies and negative observations from vetting inspections. The KPI counts the number of deficiencies (including any sub standard act, practice or condition) and negative observations, recorded during vetting inspections. The number of deficiencies and negative observations is then made relative to the total number of vetting inspections.

3.33.2 KPI References
OCIMF SIRE 2010.

3.33.3 Time Period for data capture and expression of KPI Value and Rating
PI Values captured and KPI Value expressed on a quarterly basis. When expressing the KPI Value and Rating for 2009/Q1 the time period for the PI Values’ capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

3.33.4 Vessel/Fleet measurements
This KPI is to be expressed on a vessel level. Each vessel should have its unique KPI Value and Rating on this KPI.

3.33.5 PI used
- A: Number of vetting deficiencies
- B: Number of vetting inspections

3.33.6 KPI Value Formula

\[ KPI_{value} = \frac{A}{B} \]

3.33.7 KPI Rating Formula

\[ KPI_{Rating} = 100 \times \frac{KPI_{value} - KPI_{MinReq}}{KPI_{Target} - KPI_{MinReq}} \]

**KPI MinReq** represents the KPI Value which should result in 0 on the KPI Rating scale (0-100).
MinReq for the KPI Vetting deficiencies is p.t. set to 5.
**KPI Target** represents the KPI Value which should result in 100 on the KPI Rating scale (0-100).
Target for the KPI Vetting deficiencies is p.t. set to 0.
### 3.33.8 KPI Value Calculation Example

<table>
<thead>
<tr>
<th>A</th>
<th>Number of vetting deficiencies:</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Number of vetting inspections:</td>
<td>2</td>
</tr>
<tr>
<td>KPI Value</td>
<td>Vetting deficiencies</td>
<td>(\frac{4}{2} = 2)</td>
</tr>
</tbody>
</table>

### 3.33.9 KPI Rating Calculation Example

| KPI Value | 2 |
| KPI MinReq | 5 |
| KPI Target | 0 |
| KPI Rating | \(KPI_{\text{Rating}} = \frac{KPI_{\text{Value}}}{KPI_{\text{MinReq}}} \times \frac{KPI_{\text{MinReq}}}{KPI_{\text{Target}}} = 100 \times \frac{2}{5} = 60\) |

### 3.33.10 Misc

Only vessels eligible for vetting inspections should report PI Values for this KPI. Vessels not eligible for vetting inspections will be assigned the value "N/A".
4 Performance Indicators

4.1 Actual drydocking costs

4.1.1 PI Definition
The total actual costs associated with the drydocking. Also including costs for any additional jobs which were not planned for before the drydocking started.

4.1.2 PI References
No external reference is made for this PI.

4.1.3 Used in KPI(s)

- Drydocking planning performance

4.1.4 Measurement Units
US $

4.1.5 Time Period for data capture
Captured and reported in the quarter the drydocking was completed.
If the drydocking ended on 2009-01-24 the quarter for which to report this PI Value should be 2009/Q1.
If no drydocking has been performed during a specific quarter, the PI Value for that quarter should be set to 0.

4.1.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value for this PI.

4.1.7 Numeric example
Actual drydocking costs=3,900,000

4.1.8 PI Context
This PI is used to be able to measure the deviation from a vessel's dry docking cost plan (budget) by comparing this PI value to the PI Agreed drydocking costs. Together with the PIs Actual drydocking duration and Actual drydocking duration a KPI called Drydocking planning performance is created. This KPI expresses the percentage deviation from the drydocking cost and time plan.

4.1.9 Misc
Data for this PI may be collected (and aggregated) from the invoices received from various service providers involved in the drydocking.
4.2 Actual drydocking duration

4.2.1 PI Definition
The actual duration of the yard stay for drydocking.

4.2.2 PI References
No external reference is made for this PI.

4.2.3 Used in KPI(s)

- Drydocking planning performance

4.2.4 Measurement Units
Days

4.2.5 Time Period for data capture
Captured and reported in the quarter the drydocking was completed.
If the drydocking ended on 2009-01-24 the quarter for which to report this PI Value should be 2009/Q1.
If no drydocking has been performed during a specific quarter, the PI Value for that quarter should be set to 0.

4.2.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.2.7 Numeric example
Actual drydocking duration=16

4.2.8 PI Context
This PI is used to be able to measure the deviation from a vessel’s dry docking schedule by comparing this PI value to the PI Agreed drydocking duration. Together with the PIs Actual drydocking costs and Agreed drydocking costs a KPI called Drydocking planning performance is created. This KPI expresses the percentage deviation from the drydocking cost and time plan.

4.2.9 Misc
Data for this PI may be collected from the vessels deck logbook or the yards official statement of facts.
4.3 Actual unavailability

4.3.1 PI Definition
The actual number of hours lost due to interruption of service level caused by; deficiency of personnel or stores, repairs, breakdowns and overhaul, neglect of duty of crew, medical advice or treatment of crew, detention of vessel or quarantine, planned unavailability, reduction of vessel performance regarding speed or cargo handling, non-fulfilment of charter party requirements.

4.3.2 PI References
No external reference is made for this PI.

4.3.3 Used in KPI(s)
- Vessel availability

4.3.4 Measurement Units
Hours

4.3.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.3.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.3.7 Numeric example
Actual unavailability=23

4.3.8 PI Context
This PI when compared to the PI Planned unavailability expresses a percentage of the vessel's actual availability. 100% availability is defined as a year (365*24 hours) minus the planned (agreed between charterer and owner/manager) unavailability.
4.4 Agreed drydocking costs

4.4.1 PI Definition
The total actual costs associated with the drydocking as stated in plans and budgets agreed BEFORE the drydocking starts. Agreed costs between the ship manager and the owner. Any increase in costs which are approved (agreed) AFTER the drydocking has started should not be taken into account.

4.4.2 PI References
No external reference is made for this PI.

4.4.3 Used in KPI(s)
- Drydocking planning performance

4.4.4 Measurement Units
US $

4.4.5 Time Period for data capture
Captured and reported in the quarter the drydocking is completed.
If the drydocking ended on 2009-01-24 the quarter for which to report this PI Value should be 2009/Q1.
If no drydocking has been performed during a specific quarter, the PI Value for that quarter should be set to 0.

4.4.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.4.7 Numeric example
Agreed drydocking costs = 4 000 000

4.4.8 PI Context
This PI is used to be able to measure the deviation from a vessel’s drydocking cost plan (budget) by comparing this PI value to the PI Actual drydocking costs. Together with the PIs Actual drydocking duration and Agreed drydocking duration a KPI called Drydocking planning performance is created. This KPI expresses the percentage deviation from the drydocking cost and time plan.

4.4.9 Misc
Data for this PI may be collected (and aggregated) from the owner’s cost budget.
4.5 Agreed drydocking duration

4.5.1 PI Definition
The agreed duration of the yard stay for a drydocking as agreed BEFORE the drydocking starts. This is the agreed duration as agreed between the ship manager and the owner. Any extension of the duration which is approved (agreed) AFTER the drydocking has commenced should not be taken into account.

4.5.2 PI References
No external reference is made for this PI.

4.5.3 Used in KPI(s)
- Drydocking planning performance

4.5.4 Measurement Units
Days

4.5.5 Time Period for data capture
Captured and reported in the quarter the drydocking is completed. If the drydocking ended on 2009-01-24 the quarter for which to report this PI Value should be 2009/Q1. If no drydocking has been performed during a specific quarter, the PI Value for that quarter should be set to 0.

4.5.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.5.7 Numeric example
Agreed drydocking duration= 14.0

4.5.8 PI Context
This PI is used to be able to measure the deviation from a vessel's dry docking schedule by comparing this PI value to the PI Actual drydocking duration. Together with the PIs Actual drydocking costs and Agreed drydocking costs a KPI called Drydocking planning performance is created. This KPI expresses the percentage deviation from the drydocking cost and time plan.

4.5.9 Misc
Data for this PI may be collected from the purchase order from the ship manager to the yard.
4.6 Average number of officers employed

4.6.1 PI Definition
This is the average number of officers having been under contract with the ship manager (DOC) during the last two years.

4.6.2 PI References
OCIMF’s officer retention rate as defined in TMSA.
Where OCIMF uses the term ‘employees’, the Shipping KPI standard specifies that only officers should be counted.

4.6.3 Used in KPI(s)
- Officer retention rate

4.6.4 Measurement Units
Number of officers.
Average number of officers employed in the period is found by adding the highest number of officers under contract at any time during the last two years to the lowest number of officers under contract at any time during the last two years and divide by 2.

4.6.5 Time Period for data capture
Captured for a two year rolling time period and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be from 2007-04-01 to 2009-03-31.

4.6.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.

4.6.7 Numeric example
Average number of officers employed=250

4.6.8 PI Context
This PI is part of the KPI Officer retention rate. Data is captured by analyzing your employment database two years back and identifying how many of those in the database have left and for what reason. The average number of employed officers of the period takes into account any reduction in the need for officers (reduction in fleet size).
4.7 Emitted mass of CO2

4.7.1 PI Definition
The total mass of emitted CO2 in laden and ballast condition, calculated on the basis of fuel consumption.

4.7.2 PI References
Emitted mass of CO2 is defined in IMO MEPC/Circ. 471: Interim Guidelines for voluntary ship CO2 emission indexing for use in trials and/or SISGTO conversion table from fuel to CO2.

4.7.3 Used in KPI(s)
- CO2 efficiency

4.7.4 Measurement Units
Metric tons

4.7.5 Time Period for data capture
Captured and reported on a quarterly basis. The emitted mass of CO2 must be calculated per fuel type used during the quarter. All calculations must then be aggregated to report the total mass of emitted CO2.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.7.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.7.7 Numeric example
Bunker consumption in Q1/2009: 33,232.73 metric tons Heavy Fuel Oil

Emitted mass CO2 = 33,232.73 metric tons * 3.1144 = 103,500 metric tons

<table>
<thead>
<tr>
<th>CO2 emission factors for different fuel quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of fuel</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Diesel / Gasoil</td>
</tr>
<tr>
<td>Light Fuel Oil</td>
</tr>
<tr>
<td>Heavy Fuel Oil</td>
</tr>
<tr>
<td>Liquefied Petroleum Gas (LPG)</td>
</tr>
<tr>
<td>Liquefied Petroleum Gas (LPG)</td>
</tr>
<tr>
<td>Liquefied Natural Gas (LNG)</td>
</tr>
</tbody>
</table>
4.7.8 **PI Context**
This PI is used in calculation of energy efficiency in the KPI [CO2 efficiency](#) by dividing the value on the PI [Transport work](#).

4.7.9 **Misc**
Calculation is based on the fuel consumption and fuel quality, so to be accurate the emitted mass should be calculated for each leg as this has to be compared to the transport work of the leg, therefore a rigid fuel consumption reporting regime needs to be put in place. Only legs completed should be reported, this means that a slight inaccuracy will be tolerated with respect to the definition of the quarter.
4.8 Emitted mass of NOx

4.8.1 PI Definition
The total mass of emitted NOx in laden and ballast condition, calculated on the basis of fuel consumption and engine speed.

4.8.2 PI References
The Norwegian Toll and Avgiftsdirektoratet (The Norwegian Customs and Tax department). Document (only available in Norwegian)

4.8.3 Used in KPI(s)
- NOx efficiency

4.8.4 Measurement Units
Kilogram

4.8.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.8.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.8.7 Numeric example
Bunker consumption in Q1/2009: 57143 Mtons Heavy Fuel Oil.
Vessel's engine speed: 300 RPM

\[\text{Emitted mass NOx} = \text{57143 metric tons} \times 70 \text{ kg/metric ton} = 4000010 \text{kg}\]

<table>
<thead>
<tr>
<th>NOx emission factors for different engine speed</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kg per metric ton fuel used</td>
<td>&lt; 200</td>
</tr>
<tr>
<td>70 kg per metric ton fuel used</td>
<td>200-1000</td>
</tr>
<tr>
<td>60 kg per metric ton fuel used</td>
<td>1000-1500</td>
</tr>
<tr>
<td>55 kg per metric ton fuel used</td>
<td>&gt; 1500</td>
</tr>
</tbody>
</table>

4.8.8 PI Context
This PI is used in calculation of energy efficiency in the KPI NOx efficiency by dividing the value on the PI Transport work.
4.8.9 Misc
This PI applies a rule of thumb to be generally applicable. A more accurate method exists for newer vessels which have emission certificates. Such vessels should use the more accurate method to calculate the emitted mass NOx. To be accurate the emitted mass should be calculated for each leg as this has to be compared to the transport work of the leg. Only legs completed should be reported, this means that a slight inaccuracy will be tolerated with respect to the definition of the quarter.
4.9 Emitted mass of SOx

4.9.1 PI Definition
The total mass of emitted SOx in laden and ballast condition. Calculation is based on the fuel consumption and fuel quality, so to be accurate the emitted mass should be calculated for each bunkering (or at least each change in sulphur content) and each leg and than aggregated.

4.9.2 PI References
No external reference is made for this PI.

4.9.3 Used in KPI(s)
- SOx efficiency

4.9.4 Measurement Units
Kilogram

4.9.5 Time Period for data capture
Captured and reported on a quarterly basis. The emitted mass of SOx must be calculated per fuel type (sulphur content) used during the quarter. All calculations must then be aggregated to report the total mass of emitted SOx.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.9.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.9.7 Numeric example
Bunkers consumption in Q1/2009: 22 222 metric tons Heavy Fuel Oil
Sulphur content factor: 4,5% * 20 = 90
Emitted mass SOx = 22 222 metric tons * 90 = 2 000 000 kg

4.9.8 PI Context
This PI is used in calculation of energy efficiency in the KPI SOx efficiency by dividing the value on the PI Transport work.

4.9.9 Misc
Sulphur content should be taken from fuel quality report and emissions must be calculated for each fuel quality and aggregated.
To be accurate the emitted mass should be calculated for each leg. Only legs completed should be reported, this means that a slight inaccuracy will be tolerated with respect to the definition of the quarter.
4.10 Last year’s AAE (Additional Authorized Expenses)

4.10.1 PI Definition
The amount asked by the ship manager from ship owner (or charterer) for additional expenses related to agreed exceptional items during the fiscal year.

4.10.2 PI References
No external reference is made for this PI.

4.10.3 Used in KPI(s)
- Budget performance

4.10.4 Measurement Units
US $

4.10.5 Time Period for data capture
Captured from the previous fiscal years accounts.
When reporting the PI Value for all quarters in 2009 the time period for the PI Value’s capture should be 2008-01-01 to 2008-12-31 (or the corresponding fiscal year). All quarters in 2009 should be assigned the same KPI Value.

4.10.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.10.7 Numeric example
Last year’s AAE= 250 000

4.10.8 PI Context
This PI is used in the calculation of deviation from the vessel’s running cost budget as AAE should be deducted when calculation a vessel’s actual running costs and accruals as the AAE are in fact approved by the ship owner hence it can be argued that they are in fact part of the vessel’s running cost budget.

4.10.9 Misc
This is a lagging indicator and has a severe time lag since it uses last years account figures. Regardless of this it is believed that the budget performance does not change dramatically from year to year, so this time lag should be tolerable.
4.11 Last year’s actual running costs and accruals

4.11.1 PI Definition
Total annual (fiscal year) cost per vessel including M&R, purchasing, operation, crewing, insurance and other vessel operating costs. Capital expenses such as upgrades, drydockings and modifications are not taken into account.

4.11.2 PI References
No external reference is made for this PI.

4.11.3 Used in KPI(s)
- Budget performance

4.11.4 Measurement Units
US $

4.11.5 Time Period for data capture
Captured from the previous fiscal year.
When reporting the PI Value for all quarters in 2009 the time period for the PI Value's capture should be 2008-01-01 to 2008-12-31 (or the corresponding fiscal year). All quarters in 2009 should be assigned the same PI Value.

4.11.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.11.7 Numeric example
Last year’s actual running costs and accruals = 1 500 000

4.11.8 PI Context
This PI is used to be able to measure the deviation from the last year’s running costs budget represented in percentage by comparing it to the PI Last year’s running cost budget.

4.11.9 Misc
This data may be found in the Ship Managers accounts.
This is a lagging indicator and has a severe time lag since it uses last years account figures. Regardless of this it is believed that the budget performance does not change dramatically from year to year, so this time lag should be tolerable.
4.12 Last year’s running cost budget

4.12.1 PI Definition

Total annual (fiscal) budget per vessel including M&R, purchasing, operation, crewing, insurance and other vessel operating costs. Capital expenses such as upgrades, drydockings and modifications are not taken into account.

4.12.2 PI References
No external reference is made for this PI.

4.12.3 Used in KPI(s)
- Budget performance

4.12.4 Measurement Units
US $

4.12.5 Time Period for data capture
Captured from the previous fiscal year.
When reporting the PI Value for all quarters in 2009 the time period for the PI Value’s capture should be 2008-01-01 to 2008-12-31 (or the corresponding fiscal year). All quarters in 2009 should be assigned the same PI Value.

4.12.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.12.7 Numeric example
Last year’s running cost budget per vessel = 1 200 000.

4.12.8 PI Context
This PI is used to be able to measure the deviation from last year’s running costs budget represented in percentage by comparing it to the PI Last year’s actual running costs and accruals.

4.12.9 Misc
Data for this PI may be collected (and aggregated) from the owners cost budget.
This is a lagging indicator and has a severe time lag since it uses last years account figures. Regardless of this it is believed that the budget performance does not change dramatically from year to year, so this time lag should be tolerable.
4.13 Number of absconded crew

4.13.1 PI Definition
The number of crew absent without leave (AWOL). Crew in this case refers to any person being part of the vessel’s complement. (e.g. officers, ratings, cadets, superintendents).

4.13.2 PI References
No external reference is made for this PI.

4.13.3 Used in KPI(s)
- Crew disciplinary frequency

4.13.4 Measurement Units
Number of crew AWOL

4.13.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.13.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.13.7 Numeric example
Number of Absconded crew = 0

4.13.8 PI Context
This is part of six PIs related to crew misbehaviour.

4.13.9 Misc
Data concerning this PI is taken from internal reporting and is subject to manipulation and subjective interpretations. It is therefore important that the numbers used are found in the HR system that is under some kind of a certification regime, so that the figures could be audited if a customer or client would require so.
4.14 Number of allisions

4.14.1 PI Definition
The number of occurrences the vessel strikes a fixed object.

4.14.2 PI References
No external reference is made for this PI.

4.14.3 Used in KPI(s)
- Navigational incidents

4.14.4 Measurement Units
Number of allisions

4.14.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.14.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.14.7 Numeric example
Number of allisions = 1

4.14.8 PI Context
This PI is one of three PIs used in the KPI Navigational incidents. The two other PIs are Number of collisions and Number of groundings. The categorization of navigational incidents is used to be able to identify the different types of navigational incidents.

4.14.9 Misc
Data to be captured from internal reporting as well as official incident reports to give a good and valid expression of performance in this area.
4.15 Number of ballast water management violations

4.15.1 PI Definition
The number of times where prevailing regulations regarding management of ballast water have been violated and recorded by an external party.

4.15.2 PI References
Ballast Water Management Convention.

4.15.3 Used in KPI(s)
- Ballast water management violations

4.15.4 Measurement Units
Number of violations

4.15.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.15.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.15.7 Numeric example
Number of violations = 2

4.15.8 PI Context
This PI counts the total number of violations of applicable rules and regulations related to ballast water management. The PI is the only PI in the KPI Ballast water management violations.

4.15.9 Misc
Data to be captured from external reporting give a good and valid expression of performance in this area.
4.16 Number of beneficial officer terminations

4.16.1 PI Definition
Beneficial officer terminations (i.e. sometimes those staff that do leave provide benefit to the company by virtue of leaving, for example underperformers). Termination refers to officers having been under contract with the ship manager during the last four years but not during the last two years.

4.16.2 PI References
OCIMF’s officer retention rate as defined in TMSA.

4.16.3 Used in KPI(s)
- Officer retention rate

4.16.4 Measurement Units
Number of beneficial officer terminations

4.16.5 Time Period for data capture
Captured for a two year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be from 2007-04-01 to 2009-03-31.

4.16.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.

4.16.7 Numeric example
Number of beneficial officer terminations = 1

4.16.8 PI Context
This is used in the calculation of KPI Officer retention rate, to adjust the number of terminations in case the termination is beneficial. This is a way not to penalize companies for terminating contracts with people that are underperforming. The ability to remove underperformers is regarded as a positive and good ability in a ship manager.

4.16.9 Misc
This PI is subjective in its nature but the company should document all terminations and also document the one categorized as beneficial through their HR system records. In this way the number may be audited by a customer if required.
4.17 Number of cadets under training with the ship manager

4.17.1 PI Definition
The number of cadets under training with the ship manager.

4.17.2 PI References
No external reference is made for this PI.

4.17.3 Used in KPI(s)
- Cadets per vessel

4.17.4 Measurement Units
Number of cadets under training with the ship manager

4.17.5 Time Period for data capture
Captured on the last day of the quarter and reported quarterly. When reporting the PI value for 2009/Q1 the day on which to capture the data should be 2009-03-31.

4.17.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.

4.17.7 Numeric example
Number of cadets under training with the ship manager = 123

4.17.8 PI Context
This specific PI reflects the total number of cadets under training with the ship manager. The PI is used as a nominator in the KPI Cadets per vessel where the PI Number of vessels under technical management (DOC) is the denominator, hereby expressing the average number of cadets per vessel of a ship manager.
4.18 Number of cargo related incidents

4.18.1 PI Definition
The number of incidents during cargo operations.
The PI includes but is not limited to the following incidents:

- Rejection of vessel or holds/tank prior to loading
- Inability to load full agreed capacity
- Failures/underperformance of ship's cargo equipment
- Negligence by ship's crew resulting in a cargo incident
- Inadequate company and ship board procedures and practices

The PI excludes the following incidents due to:

- Stevedore/shore staff
- Inherent vice (nature of cargo)
- Shore equipment
- Causes not attributable to the ship
- False declarations by the shipper, etc.

4.18.2 PI References
No external reference is made for this PI.

4.18.3 Used in KPI(s)

- Cargo related incidents

4.18.4 Measurement Units
Number of incidents during cargo operations

4.18.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.18.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.18.7 Numeric example
Number of incidents during cargo operations = 1

4.18.8 PI Context
This PI is the only PI in the KPI Cargo related incidents
4.19 Number of cases where a crew member is sick for more than 24 hours

4.19.1 PI Definition
The number of cases where an individual among the crew or any person being part of the vessel's complement (e.g. officers, ratings, cadets, superintendents) is sick for more than 24 hours. The individual must have been onboard the vessel for a minimum of four days.

4.19.2 PI References
No external reference is made for this PI.

4.19.3 Used in KPI(s)
- Lost Time Sickness Frequency

4.19.4 Measurement Units
Number of cases

4.19.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.19.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.19.7 Numeric example
Number of cases = 2

4.19.8 PI Context
This PI is part of 3 PIs that together form the KPI Lost Time Sickness Frequency by counting cases of sickness over 24 hours as well as fatalities due to sickness and use the PI Total exposure hours as a denominator to get the frequency.
4.20 Number of cases where drugs or alcohol is abused

4.20.1 PI Definition
The number of cases where any person being part of the vessel's complement. (e.g. officers, ratings, cadets, superintendents) is caught abusing drugs or alcohol.

4.20.2 PI References
No external reference is made for this PI.

4.20.3 Used in KPI(s)
- Crew disciplinary frequency

4.20.4 Measurement Units
Number of cases

4.20.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.20.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.20.7 Numeric example
Number of times drugs or alcohol is abused = 0

4.20.8 PI Context
This PI is related to crew misbehaviour. All incidents are used in calculation of the KPI Crew disciplinary frequency with the PI Total exposure hours used as a denominator.

4.20.9 Misc
The number of cases are based on that there exist a documented record of the abuse. This indicates that people with alcohol and drug addictions are counted each time they have a logged warning or any other written record of their abuse.
4.21 Number of charges of criminal offences

4.21.1 PI Definition
Number of cases where any person being part of the vessel’s complement. (e.g. officers, ratings, superintendents) is charged with a criminal offence. In cases where the charge is later withdrawn, the relevant PI Value should not be updated.

4.21.2 PI References
No external reference is made for this PI.

4.21.3 Used in KPI(s)
- Crew disciplinary frequency

4.21.4 Measurement Units
Number of charges

4.21.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.21.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.21.7 Numeric example
Number of cases = 2

4.21.8 PI Context
This PI is part of 6 PIs related to crew misbehaviour. All incidents (all PIs) together are used in calculation of the KPI Crew disciplinary frequency with the total exposure hours used as a denominator.
4.22 Number of collisions

4.22.1 PI Definition
The number of collision incidents between the vessel and floating objects.

4.22.2 PI References
No external reference is made for this PI.

4.22.3 Used in KPI(s)
- Navigational incidents

4.22.4 Measurement Units
Number of collisions

4.22.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.22.6 Vessel/Fleet measurement
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.22.7 Numeric example
Number of collisions = 0

4.22.8 PI Context
This PI is one of three used in the KPI Navigational incidents, the two other PIs are Number of allisions and Number of groundings. The categorization of navigational incidents is used to be able to identify the different types of navigational incidents.
4.23 Number of conditions of class

4.23.1 PI Definition
Number of conditions of class issued during the reporting period. Condition of class is a written statement from class (ref. IACS).

4.23.2 PI References
IACS

4.23.3 Used in KPI(s)
- Condition of class

4.23.4 Measurement Units
Number of conditions of class

4.23.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.23.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.23.7 Numeric example
Number of conditions of class = 1

4.23.8 PI Context
This PI reports the number of conditions of class that are stated for the vessel. The PI is the only PI in the KPI Condition of class as there is no need for a common denominator (such as the total number of class inspections) in the KPI for benchmarking purposes.

4.23.9 Misc
Data concerning this PI can be taken from class inspection reports, and should be aggregated from the inspections held during the reporting period.
4.24 Number of contained spills of bulk liquid

4.24.1 PI Definition
Total number of spills on deck (where nothing goes overboard) of bulk liquids which could have had an environmental impact.

4.24.2 PI References
No external reference is made for this PI.

4.24.3 Used in KPI(s)
- Contained spills

4.24.4 Measurement Units
Number of contained spills

4.24.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.24.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.24.7 Numeric example
Number of contained spills = 6

4.24.8 PI Context
Some spills are contained but still represent an incident that should be recorded. This PI counts the total number of contained spills and feeds into the KPI Contained spills as the only PI.

4.24.9 Misc
Data concerning this PI is taken from internal reporting and is subject to manipulation and subjective interpretations. Data for this PI have to be based on internal reporting and the procedure and process for such reporting should be included in the QA system so that the process can be audited. Spills contained in areas which have not potential environmental impact, like engine room are not to be reported.
4.25 Number of crew not relieved on time

4.25.1 PI Definition
Number of crew not relieved within the agreed tenure of contract, excluding extensions initiated by crew, but including extensions initiated by the manager.

4.25.2 PI References
No external reference is made for this PI.

4.25.3 Used in KPI(s)
- Crew planning

4.25.4 Measurement Units
Number of crew

4.25.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.25.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.25.7 Numeric example
Number of crew not relieved on time = 1

4.25.8 PI Context
This PI is used in the KPI Crew planning which reflects the ship manager’s ability to adhere to agreed tenure of contracts as well as official requirements related to rest hours.
4.26 Number of dismissed crew

4.26.1 PI Definition
The number of cases where any person being part of the vessel’s complement. (e.g. officers, ratings, cadets, superintendents) has been dismissed due to breach of discipline before end of contract.

4.26.2 PI References
No external reference is made for this PI.

4.26.3 Used in KPI(s)
- Crew disciplinary frequency

4.26.4 Measurement Units
Number of dismissed crew

4.26.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.26.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.26.7 Numeric example
Number of dismissed crew = 0

4.26.8 PI Context
This PI is part of 6 PIs related to crew misbehaviour. All incidents (all PIs) together are used in calculation of the KPI Crew disciplinary frequency with the PI Total exposure hours used as a denominator.

4.26.9 Misc
Data concerning this PI is taken from internal reporting and is subject to manipulation and subjective interpretations. Reporting routines should be part of the QA system and as such be subject to audit.
4.27 Number of environmental related deficiencies

4.27.1 PI Definition
Environmental related deficiencies including any sub standard act, practice or condition of an environmental consequence (local regulations and MARPOL) recorded during external inspections and audits by external bodies (class, port state, flag state, underwriters, charterers, ITF) including ISO/ISM/OHSAS audits, excluding her voluntary inspections made for the purpose of quality improvement.

4.27.2 PI References
No external reference is made for this PI.

4.27.3 Used in KPI(s)
- Environmental deficiencies

4.27.4 Measurement Units
Number of environmental related deficiencies

4.27.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.27.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.27.7 Numeric example
Number of environmental related deficiencies = 13

4.27.8 PI Context
This PI is one of several PIs that capture information concerning deficiencies. A system of 6 categories of deficiencies (environmental, HR, security, operational, navigational and safety) are feeding values into 6 different KPIs (based on the same categorization) with the PI ‘Number of external inspections’ as the common denominator in all KPIs for benchmarking purposes.

4.27.9 Misc
The categorization of deficiencies (according to the PIs in the Shipping KPI Performance Hierarchy) must be done subjectively.
4.28 Number of explosion incidents

4.28.1 PI Definition
The number of explosion incidents onboard a vessel as reported in the company’s internal incident reports.

4.28.2 PI References
No external reference is made for this PI.

4.28.3 Used in KPI(s)
- Fire and Explosions

4.28.4 Measurement Units
Number of incidents

4.28.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.28.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.28.7 Numeric example
Number of explosion incidents = 0

4.28.8 PI Context
This PI counts the total number of explosion incidents onboard a vessel and together with the PI Number of fire incidents form the KPI Fire and Explosions.
4.29 Number of failures of critical equipment and systems

4.29.1 PI Definition
The number of failures to equipment and systems in the critical list as defined in the company's Safety and Environmental Management System.

4.29.2 PI References
No external reference is made for this PI.

4.29.3 Used in KPI(s)
- Failure of critical equipment and systems

4.29.4 Measurement Units
Number of failures of critical equipment and systems

4.29.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.29.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.29.7 Numeric example
Number of failures of critical equipment and systems = 3

4.29.8 PI Context
This PI is the only PI for the KPI Failure of critical equipment and systems.

4.29.9 Misc
As the vessels' critical lists may vary in size it could be argued that e.g. the number of items on the list could be used as a denominator for benchmarking purposes. In any case, a failure of a critical equipment or system is a serious matter, regardless of the number of items in the vessel's critical list, and the KPI 'Failure of critical equipment and systems' is kept without a denominator.
This information should be possible to deduct from the PMS and if multiple faults result in the same unavailability they should all be counted, as this PI is to measure the state of the system, not the consequence of the failure.
4.30 Number of fatalities due to injuries

4.30.1 PI Definition
Number of deaths among the crew or any person being part of the vessel's complement (e.g. officers, ratings, cadets, superintendents) resulting from a work injury (not illness or other conditions) regardless of the length of time between the injury and death (OCIMF).

4.30.2 PI References
LTIF is defined by OCIMF

4.30.3 Used in KPI(s)
- Lost Time Injury Frequency

4.30.4 Measurement Units
Number of fatalities due to injuries

4.30.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.30.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.30.7 Numeric example
Number of fatalities due to injuries = 0

4.30.8 PI Context
This PI is part of 5 PIs that together form the KPI Lost Time Injury Frequency by counting all lost workday cases, fatalities due to injuries, permanent total disabilities and permanent partial disabilities and use the Total exposure hours as a denominator to get the frequency.
4.31 Number of fatalities due to sickness

4.31.1 PI Definition
Number of deaths among the crew or any person being part of the vessel’s complement (e.g. officers, ratings, cadets, superintendents) resulting from work related illness regardless of the length of time between the emerging symptoms of the illness and death, also including suicide.

4.31.2 PI References
No external reference is made for this PI.

4.31.3 Used in KPI(s)
- Lost Time Sickness Frequency

4.31.4 Measurement Units
Number of fatalities due to sickness

4.31.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis.
When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.31.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.31.7 Numeric example
Number of fatalities due to sickness = 0

4.31.8 PI Context
This PI is part of 3 PIs that together form the KPI Lost Time Sickness Frequency by counting cases of sickness over 24 hours as well as fatalities due to sickness and use the Total exposure hours as a denominator to get the frequency

4.31.9 Misc
This PI can also be used to get an indication if the work environment is influencing the mortality of the seamen.
4.32 Number of fire incidents

4.32.1 PI Definition
The number of fire incidents onboard the vessel as reported in the company's internal incident reports.

4.32.2 PI References
No external reference is made for this PI.

4.32.3 Used in KPI(s)
- Fire and Explosions

4.32.4 Measurement Units
Number of fire incidents

4.32.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.32.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.32.7 Numeric example
Number of fire incidents = 1

4.32.8 PI Context
This PI counts the total number of fire incidents onboard a vessel and together with the PI Number of explosion incidents form the KPI Fire and Explosions.

4.32.9 Misc
False alarms are not counted; the severity of the fire is not factored in, just the occurrence of fire.
4.33 Number of groundings
4.33.1 PI Definition
Contact by the vessel with the sea bed

4.33.2 PI References
No external reference is made for this PI.

4.33.3 Used in KPI(s)
- Navigational incidents

4.33.4 Measurement Units
Number of groundings

4.33.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be
the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.33.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.33.7 Numeric example
Number of groundings = 0

4.33.8 PI Context
This PI is one of three PIs used in the KPI Navigational incidents. The two other PIs are
Number of collisions and Number of allisions. The categorization of navigational incidents
is used to be able to identify the different types of navigational incidents.
4.34 Number of health and safety related deficiencies

4.34.1 PI Definition
Health and safety related deficiencies including any sub standard act, practice or condition recorded during external inspections and audits by external bodies (class, port state, flag state, underwriters, charterers, ITF) including ISO/ISM/OHSAS audits, excluding other voluntary inspections made for the purpose of quality improvement.

4.34.2 PI References
No external reference is made for this PI.

4.34.3 Used in KPI(s)
- Health and Safety deficiencies

4.34.4 Measurement Units
Number of health and safety related deficiencies

4.34.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.34.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.34.7 Numeric example
Number of health and safety related deficiencies = 3

4.34.8 PI Context
This PI is one of several PIs that capture information concerning deficiencies. A system of 6 categories of deficiencies (environmental, HR, security, operational, navigational and safety) are feeding values into 6 different KPIs (based on the same categorization) with the PI Number of recorded external inspections as the common denominator in all KPIs for benchmarking purposes.

4.34.9 Misc
The categorization of deficiencies (according to the PIs in the Shipping KPI Performance Hierarchy) must be done subjectively.
4.35 Number of HR related deficiencies

4.35.1 PI Definition
HR related deficiencies including any sub standard act, practice or condition recorded during external inspections and audits by external bodies (class, port state, flag state, underwriters, charterers, ITF) including ISO/ISM/OHSAS audits, excluding other voluntary inspections made for the purpose of quality improvement.

4.35.2 PI References
No external reference is made for this PI.

4.35.3 Used in KPI(s)
- HR deficiencies

4.35.4 Measurement Units
Number of HR related deficiencies

4.35.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.35.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.35.7 Numeric example
Number of HR related deficiencies = 3

4.35.8 PI Context
This PI is one of several PIs that capture information concerning deficiencies. A system of 6 categories of deficiencies (environmental, HR, security, operational, navigational and safety) are feeding values into 6 different KPIs (based on the same categorization) with the PI Number of recorded external inspections as the common denominator in all KPIs for benchmarking purposes.

4.35.9 Misc
The categorization of deficiencies (according to the PIs in the Shipping KPI Performance Hierarchy) must be done subjectively.
4.36 Number of logged warnings

4.36.1 PI Definition
Any logged warning given by superior to any person being part of the vessel’s complement (e.g. officers, ratings, cadets, superintendents).

4.36.2 PI References
No external reference is made for this PI.

4.36.3 Used in KPI(s)
- Crew disciplinary frequency

4.36.4 Measurement Units
Number of logged warnings

4.36.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.36.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.36.7 Numeric example
Number of logged warnings = 1

4.36.8 PI Context
This PI is part of 6 PIs related to crew misbehaviour. All incidents (all PIs) together are used in calculation of the KPI Crew disciplinary frequency with the Total exposure hours as a denominator.

4.36.9 Misc
Any logged warning s in this context can also mean verbal warnings, but there has to exist a record of such a verbal warning being issued for it to count.
4.37 Number of lost workday cases

4.37.1 PI Definition
Number of injuries among the crew or any person being part of the vessel’s complement (e.g. officers, ratings, cadets, superintendents) which results in the individual being unable to carry out his duties or to return to work, or to a scheduled work shift on the next day following the injury, unless caused by delays in getting medical treatment ashore (OCIMF).

4.37.2 PI References
LTIF is defined by OCIMF.

4.37.3 Used in KPI(s)

- Lost Time Injury Frequency

4.37.4 Measurement Units
Number of Lost Workday Cases

4.37.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.37.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.37.7 Numeric example
Number of Lost Workday Cases = 1

4.37.8 PI Context
This PI is part of 5 PIs that together form the KPI Lost Time Injury Frequency by counting all lost workday cases, fatalities due to injuries, permanent total disabilities and permanent partial disabilities and use the total exposure hours as a denominator to get the frequency.

4.37.9 Misc
Data for this should normally be captured from time sheet databases or from injury records.
4.38 Number of navigational related deficiencies

4.38.1 PI Definition
Navigational related deficiencies including any sub standard act, practice or condition, recorded during external inspections and audits by external bodies (class, port state, flag state, underwriters, charterers, ITF) including ISO/ISM audits, excluding other voluntary inspections made for the purpose of quality improvement.

4.38.2 PI References
No external reference is made for this PI.

4.38.3 Used in KPI(s)
- Navigational deficiencies

4.38.4 Measurement Units
Number of navigational related deficiencies

4.38.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.38.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.38.7 Numeric example
Number of navigational related deficiencies = 4

4.38.8 PI Context
This PI is one of several PIs that capture information concerning deficiencies. A system of 6 categories of deficiencies (environmental, HR, security, operational, navigational and safety) are feeding values into 6 different KPIs (based on the same categorization) with the PI Number of recorded external inspections as the common denominator in all KPIs for benchmarking purposes.

4.38.9 Misc
Categorization of deficiencies (according to the PIs in the Shipping KPI Performance Hierarchy) must be done subjectively.
4.39 Number of officer days onboard all vessels under technical management (DOC)

4.39.1 PI Definition
Number of officer days onboard all vessels under technical management (DOC)

4.39.2 PI References
No external reference is made for this PI.

4.39.3 Used in KPI(s)
- Training days per officer

4.39.4 Measurement Units
Number of officer days onboard all vessels under technical management (DOC)

4.39.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.39.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.

4.39.7 Numeric example
Number of officer days onboard all vessels under technical management (DOC) = 4500

4.39.8 PI Context
This specific PI reflects the total number of officer days onboard which is used as a denominator in the KPI Training days per officer. This figure is the aggregated sailing time the officers currently sailing have had with this manager.

4.39.9 Misc
This PI has the challenge that if the crew has varying experience length this may vary from one reporting period to the next and the PI will have fluctuation that has nothing to do with the ship manager, merely by the available crew.
4.40 Number of officer experience points

4.40.1 PI Definition
For each officer onboard; assign experience points on basis of the number of months the officer has sailed with the same ship manager (including different DOC holding entities as long as the same SMS is being used).

Assign experience points according to the figures below:

5,9 or less months of experience equals 1 experience point
Between 6 and 8,9 months of experience equals 2 experience points
Between 9 and 11,9 months of experience equals 3 experience points
12 months or more of experience equals 4 experience points (this is the maximum number of points given)

4.40.2 PI References
No external reference is made for this PI.

4.40.3 Used in KPI(s)
- Officers experience rate

4.40.4 Measurement Units
Number of officer experience points.

4.40.5 Time Period for data capture
Captured on the last day of the quarter and reported quarterly.
When reporting the PI value for 2009/Q1 the day on which to capture the data should be 2009-03-31.

4.40.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.40.7 Numeric example
On a specific vessel:
The master has 24 sailing months with the same ship manager (on different vessels): =4 points
The 1st officer has 6 sailing months with the same ship manager: = 2 points
The remaining 7 officers all have more than 12 sailing months with the same ship manager: =4 points X 7 officers=28 points
**Number of officer experience points = 34**

4.40.8 PI Context
This PI is used in the KPI Officers experience rate which expresses the percentile experience of the officers currently onboard the vessel on basis of 12 months of experience as 100%.
4.41 Number of officer terminations from whatever cause

4.41.1 PI Definition
The total number officers that have left the company for what ever reason. Termination refers to officers having been under contract with the ship manager during the last four years but not during the last two years.

4.41.2 PI References
OCIMF

4.41.3 Used in KPI(s)
- Officer retention rate

4.41.4 Measurement Units
Number of officer terminations

4.41.5 Time Period for data capture
Captured for a two year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be from 2007-04-01 to 2009-03-31

4.41.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.

4.41.7 Numeric example
Number of officer terminations = 23

4.41.8 PI Context
This specific PI reflects the ship manager ability to retain their officers

4.41.9 Misc
This PI is subjective in its nature but the company should document all terminations and also document the one categorized as beneficial through their HR system records. In this way the number may be audited by a customer if required.
4.42 Number of officer trainee man days

4.42.1 PI Definition
Number of officer trainee man days. Training = Training exceeding statutory requirements performed by formal trainer on shore or onboard (excluding computer-based). Ten officers under training for two days equals 20 officer trainee man days.

4.42.2 PI References
No external reference is made for this PI.

4.42.3 Used in KPI(s)
- Training days per officer

4.42.4 Measurement Units
Number of officer trainee man days

4.42.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.42.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.

4.42.7 Numeric example
Number of officer trainee man days = 59

4.42.8 PI Context
This specific PI reflects the number of training days conducted by the ship manager which is used as a nominator in the KPI Training days per officer.

4.42.9 Misc
In this context the trainee man days is the number of days the officer have been a trainee. We count all days where an officer have attended training as defined above, but if the training is less than 25% of a day it should not be counted. In cases where training is done iteratively in short burst, it is left up to the judgment of the company to estimate an equivalent number of days.
4.43 Number of officers onboard

4.43.1 PI Definition
The number of officers currently onboard the vessel.

4.43.2 PI References
No external reference is made for this PI.

4.43.3 Used in KPI(s)
- Officers experience rate

4.43.4 Measurement Units
Number of officers onboard

4.43.5 Time Period for data capture
Captured on the last day of the quarter and reported quarterly.
When reporting the PI value for 2009/Q1 the day on which to capture the data should be 2009-03-31.

4.43.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.43.7 Numeric example
Number of officers onboard = 10

4.43.8 PI Context
This specific PI reflects the total number of officer onboard which is used as a denominator in the KPI Officers experience rate.

4.43.9 Misc
Capturing the number of officers on the last day of the quarter does not give an accurate level of officers, as this may be affected by temp staff onboard or other activities. Regardless of this is a very easy way to determine the number of officers, and for all practical purposes this is believed to be accurate enough to determine the average experience of the officers onboard.
4.44 Number of operational related deficiencies

4.44.1 PI Definition
Operational related deficiencies (not including HR-, security-, health and safety- and environmental deficiencies) including any sub standard act, practice or condition recorded during external inspections and audits by external bodies (class, port state, flag state, underwriters, charterers, ITF) including ISO/ISM/OHSAS audits, excluding other voluntary inspections made for the purpose of quality improvement.

4.44.2 PI References
No external reference is made for this PI.

4.44.3 Used in KPI(s)

- Operational deficiencies

4.44.4 Measurement Units
Number of operational related deficiencies

4.44.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.44.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.44.7 Numeric example
Number of operational related deficiencies = 1

4.44.8 PI Context
This PI is one of several PIs that capture information concerning deficiencies. A system of 6 categories of deficiencies (environmental, HR, security, operational, navigational and safety) are feeding values into 6 different KPIs (based on the same categorization) with the PI Number of recorded external inspections as the common denominator in all KPIs for benchmarking purposes.

4.44.9 Misc
The categorization of deficiencies (according to the PIs in the Shipping KPI Performance Hierarchy) must be done subjectively.
4.45 Number of passengers injured

4.45.1 PI Definition
The number of passengers injured during embarkation, disembarkation and voyage. The number is taken from received claims. If the claim is later withdrawn, the relevant PI should not be updated.

4.45.2 PI References
No external reference is made for this PI.

4.45.3 Used in KPI(s)

- Passenger injury ratio

4.45.4 Measurement Units
Number of passengers injured

4.45.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31. Count up until the last port call in the relevant quarter.

4.45.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.45.7 Numeric example
Number of passengers injured = 5

4.45.8 PI Context
This PI is used as the KPI Passenger injury ratio and captures data related to the number of injured passengers.

4.45.9 Misc
Data concerning this PI is taken from official claims reports received by the ship manager from the ship owner/operator depending on who the passenger directs the claim to.
4.46 Number of permanent partial disabilities

4.46.1 PI Definition
The number of injuries among the crew or any person being part of the vessel’s complement (e.g. officers, ratings, cadets, superintendents) which results in complete loss, or permanent loss of use, of any member or part of the body, or any impairment of functions of parts of the body, regardless of any pre-existing disability of the injured member or impaired body function, that partially restricts or limits an employee’s basis to work on a permanent basis at sea. Such an individual could be employed ashore but not at sea in line with industry guidelines (OCIMF).

4.46.2 PI References
LTIF is defined by OCIMF

4.46.3 Used in KPI(s)
- Lost Time Injury Frequency

4.46.4 Measurement Units
Number of Permanent Partial Disabilities

4.46.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.46.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.46.7 Numeric example
Number of Permanent Partial Disabilities = 0

4.46.8 PI Context
This PI is part of 5 PIs that together form the KPI Lost Time Injury Frequency by counting all lost workday cases, fatalities due to injuries, permanent total disabilities and permanent partial disabilities and use the Total exposure hours as a denominator to get the frequency.

4.46.9 Misc
Permanent Partial Disability should be based on medical judgment and be picked from a medical statement about the %disability of the employee.
4.47 Number of permanent total disabilities (PTD)

4.47.1 PI Definition
The number of injuries among the crew or any person being part of the vessel’s complement (e.g. officers, ratings, cadets, superintendents) which incapacitates the individual permanently and results in termination of employment on medical grounds (e.g. loss of limb(s) permanent brain damage, loss of sight) and precludes the individual from working either at sea or shore (OCIMF).

4.47.2 PI References
LTIF is defined by OCIMF.

4.47.3 Used in KPI(s)
• Lost Time Injury Frequency

4.47.4 Measurement Units
Number of Permanent Total Disabilities

4.47.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.47.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.47.7 Numeric example
Number of Permanent Total Disabilities = 0

4.47.8 PI Context
This PI is part of 5 PIs that together form the KPI Lost Time Injury Frequency by counting all lost workday cases, fatalities due to injuries, permanent total disabilities and permanent partial disabilities and use the Total exposure hours as a denominator to get the frequency.

4.47.9 Misc
Permanent Total Disability should be based on medical judgment and be picked from a medical statement.
4.48 Number of PSC deficiencies

4.48.1 PI Definition
The number of deficiencies, excluding observations (code 99), found during port state control inspections.

4.48.2 PI References
No external reference is made for this PI.

4.48.3 Used in KPI(s)
- Port state control deficiency ratio

4.48.4 Measurement Units
Number of PSC deficiencies

4.48.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.48.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.48.7 Numeric example
Number of PSC deficiencies = 12

4.48.8 PI Context
A comprehensive picture regarding port state control performance is considered as vital.
This PI together with the PI Number of PSC inspections provides a ratio of the total number of deficiencies over the total number of PSC inspections, which is a deficiency ratio giving average number of deficiencies per inspection.

4.48.9 Misc
This PI reports the deficiencies and is used to measure the number of deficiencies; it is not used to measure the responsiveness to close deficiencies found.
4.49 Number of PSC inspections
4.49.1 PI Definition
The number of port state control inspections

4.49.2 PI References
No external reference is made for this PI.

4.49.3 Used in KPI(s)
- Flawless Port State Control performance
- Port state control deficiency ratio

4.49.4 Measurement Units
Number of PSC inspections

4.49.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.49.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.49.7 Numeric example
Number of PSC inspections = 4

4.49.8 PI Context
This PI is used as the denominator in two KPIs (Flawless Port State Control performance and Port state control deficiency ratio) to enable benchmarking of vessels even with a different number of port state control inspections (hence a different risk for receiving deficiencies/detentions in the first place) during the reporting period.

4.49.9 Misc
Data concerning this PI is captured by counting the number of port state control inspections. In the case a vessel is under inspection at the period end, only completed PSC should be reported for the PI.
4.50 Number of PSC inspections resulting in a detention

4.50.1 PI Definition
The number of port state control inspections, excluding verifications, resulting in a detention (code 30). Multiple reasons for issuing a detention in one inspection count as ONE detention in the PI.

4.50.2 PI References
IMO
RESOLUTION A.882(21), adopted on 25 November 1999
AMENDMENTS TO THE PROCEDURES FOR PORT STATE CONTROL
(RESOLUTION A.787(19))

4.50.3 Used in KPI(s)
- Port state control detention

4.50.4 Measurement Units
Number of PSC inspections resulting in a detention

4.50.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.50.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.50.7 Numeric example
Number of PSC inspections resulting in a detention = 1

4.50.8 PI Context
This PI counts the number of port state control inspections resulting in a detention. This is because a comprehensive picture regarding port state control performance is considered as vital.

4.50.9 Misc
Data concerning this PI can be taken from counting all port state control inspection reports taken place during the period which resulted in a detention (code 30).
4.51 Number of PSC inspections resulting in zero deficiencies

4.51.1 PI Definition
The number of port state control inspections resulting in zero deficiencies (not counting observations – code 99).

4.51.2 PI References
No external reference is made for this PI.

4.51.3 Used in KPI(s)
- Flawless Port State Control performance

4.51.4 Measurement Units
Number of PSC inspections

4.51.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.51.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.51.7 Numeric example
Number of PSC inspections resulting in zero deficiencies = 2

4.51.8 PI Context
This PI is used in the KPI Flawless Port State Control performance which expresses the percentage of port state controls resulting in zero deficiencies against the total number of port state control inspections conducted.

4.51.9 Misc
Data concerning this PI is captured by counting the number of PSC inspections where no deficiencies are reported. If only code 99 observations are found the PSC is said to have no deficiencies.
4.52 Number of recorded external inspections

4.52.1 PI Definition
The number of recorded inspections and audits by external bodies (class, port state, flag state, underwriters, charterers, ITF) including external ISO/ISM/ISPS/OHSAS audits, excluding other voluntary inspections made for the purpose of quality improvement.

4.52.2 PI References
No external reference is made for this PI.

4.52.3 Used in KPI(s)
- Environmental deficiencies
- HR deficiencies
- Security deficiencies
- Operational deficiencies
- Health and Safety deficiencies
- Navigational deficiencies

4.52.4 Measurement Units
Number of recorded external inspections

4.52.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.52.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.52.7 Numeric example
Number of recorded external inspections = 2

4.52.8 PI Context
This PI serves as a common denominator in 6 different KPIs (for benchmarking purposes) related to deficiencies identified during external inspections.

4.52.9 Misc
Data concerning this PI can be taken from summing up all external inspections for the vessel during the reporting period.
4.53 Number of releases of substances covered by MARPOL, to the environment

4.53.1 PI Definition
The number of releases of substances covered by MARPOL, to the environment. Only releases which are discovered and reported internally should be counted.

4.53.2 PI References
No external reference is made for this PI.

4.53.3 Used in KPI(s)
- Releases of substances as def by MARPOL Annex 1-6

4.53.4 Measurement Units
Number of releases

4.53.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.53.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.53.7 Numeric example
Releases of substances as def by MARPOL= 1

4.53.8 PI Context
This PI together with the PI Number of severe spills of bulk liquid makes the KPI Releases of substances as def by MARPOL Annex 1-6 by counting the total number of spills, liquid (covered by the PI Number of severe spills of bulk liquid) or solids (this PI).
4.54 Number of security related deficiencies

4.54.1 PI Definition
Security deficiencies including any sub standard act, practice or condition recorded during external inspections and audits by external bodies (class, port state, flag state, underwriters, charterers, ITF) including ISO/ISM/OHSAS audits, excluding other voluntary inspections made for the purpose of quality improvement.

4.54.2 PI References
No external reference is made for this PI.

4.54.3 Used in KPI(s)
- Security deficiencies

4.54.4 Measurement Units
Number of security related deficiencies

4.54.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.54.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.54.7 Numeric example
Number of security related deficiencies = 3

4.54.8 PI Context
This PI is one of several PIs that capture information concerning deficiencies. A system of 6 categories of deficiencies (environmental, HR, security, operational, navigational and safety) are feeding values into 6 different KPIs (based on the same categorization) with the PI Number of recorded external inspections as the common denominator in all KPIs for benchmarking purposes.

4.54.9 Misc
The categorization of deficiencies (according to the PIs in the Shipping KPI Performance Hierarchy) must be done subjectively.
4.55 **Number of severe spills of bulk liquid**

4.55.1 **PI Definition**
A severe spill is a spill above one barrel (42 US gallons or 159 metric litres). The spill has to be to the environment. Only spills which are discovered and reported internally should be counted.

4.55.2 **PI References**
No external reference is made for this PI.

4.55.3 **Used in KPI(s)**
- [ Releases of substances as def by MARPOL Annex 1-6 ]

4.55.4 **Measurement Units**
Number of severe spills

4.55.5 **Time Period for data capture**
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.55.6 **Vessel/Fleet measurement**
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.55.7 **Numeric example**
Number of severe spills = 0

4.55.8 **PI Context**
This PI together with the PI [Number of releases of substances covered by MARPOL, to the environment] form the KPI [Releases of substances as def by MARPOL Annex 1-6] by counting the total number of spills, liquid (this PI) or solids (covered by the PI Number of releases of substances covered by MARPOL, to the environment)
4.56 Number of unavoidable officer terminations

4.56.1 PI Definition
Unavoidable officer terminations are retirements, long term illness and officers following a vessel which is no longer under technical management. Termination refers to officers having been under contract with the ship manager during the last four years but not during the last two years.

4.56.2 PI References
No external reference is made for this PI.

4.56.3 Used in KPI(s)
- Officer retention rate

4.56.4 Measurement Units
Number of unavoidable officer terminations

4.56.5 Time Period for data capture
Captured for a two year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be from 2007-04-01 to 2009-03-31

4.56.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder

4.56.7 Numeric example
Number of unavoidable officer terminations = 5

4.56.8 PI Context
This is used in the KPI Officers retention rate and is used to adjust the number of termination not to penalize the company for natural terminations outside of the control of the company.
4.57 Number of vessels under technical management (DOC)

4.57.1 PI Definition
The number of vessels under technical management (DOC).

4.57.2 PI References
No external reference is made for this PI.

4.57.3 Used in KPI(s)
- Cadets per vessel

4.57.4 Measurement Units
Number of vessels under technical management (DOC)

4.57.5 Time Period for data capture
Captured on the last day of the quarter and reported quarterly. When reporting the PI Value for 2009/Q1 the time for data capture should be 2009-03-31.

4.57.6 Vessel/Fleet measurement
This PI is reported for the Strategic Business Unit (SBU). SBU is a legal entity directly under the main company. Some companies may not have SBUs then the company itself is the SBU. All vessels under technical management by an SBU or by companies directly under the SBU (holding the DOC for the vessel) should be given the same PI Value on this PI. The PI value must be obtained on SBU level and issued to the DOC holder for inclusion in the reporting from the DOC holder.

4.57.7 Numeric example
Number of vessels under technical management (DOC) = 134

4.57.8 PI Context
This specific PI gives the total number of vessels under technical management, which is used as a denominator in the KPI Cadets per vessel.

4.57.9 Misc
Please note that all vessels for which you hold the DOC should be counted, not only the number of vessels which are currently part of the Shipping KPI reporting regime.
4.58 Number of vetting deficiencies

4.58.1 PI Definition
Any deficiency or negative observation from vetting inspections.

4.58.2 PI References
OCIMF SIRE 2010.

4.58.3 Used in KPI(s)
- Vetting deficiencies

4.58.4 Measurement Units
Number of vetting deficiencies

4.58.5 Time Period for data capture
Captured and reported on a quarterly basis. When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.58.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.58.7 Numeric example
Number of vetting deficiencies = 13

4.58.8 PI Context
This PI is the nominator in the KPI Vetting deficiencies
4.59 Number of vetting inspections

4.59.1 PI Definition
The number of vetting inspections the vessel has had

4.59.2 PI References
OCIMF SIRE 2010.

4.59.3 Used in KPI(s)
- Vetting deficiencies

4.59.4 Measurement Units
Number of vetting inspections

4.59.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be
the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.59.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.59.7 Numeric example
Number of vetting inspections = 2

4.59.8 PI Context
This PI is the denominator in the KPI Vetting deficiencies.

4.59.9 Misc
Data concerning this PI can be taken from summing up all vetting inspections the vessel has
had during the reporting period.
4.60 Number of violations of rest hours

4.60.1 PI Definition
The number of cases with violation of STCW or ILO conventions regarding rest or work hours.

4.60.2 PI References
STCW and ILO.

4.60.3 Used in KPI(s)
- Crew planning

4.60.4 Measurement Units
Number of violations of rest hours

4.60.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31.

4.60.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.60.7 Numeric example
Number of violations of rest hours = 4

4.60.8 PI Context
This PI is used in the KPI Crew planning which reflects the ship manager’s ability to adhere to official requirements related to rest hours as well as agreed tenure of contracts.

4.60.9 Misc
Even if a crew member agrees to the breach of rest hour conventions the breach shall be counted.
4.61 Passenger exposure hours
4.61.1 PI Definition
The passenger exposure hours.

4.61.2 PI References
No external reference is made for this PI.

4.61.3 Used in KPI(s)
- Passenger injury ratio

4.61.4 Measurement Units
Passenger exposure hours.

4.61.5 Time Period for data capture
Captured and reported on a quarterly basis.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be
the first quarter of 2009; 2009-01-01 to 2009-03-31. Count up until the last port call in the
relevant quarter.

4.61.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.61.7 Numeric example
Passenger exposure hours = 100 000

4.61.8 PI Context
This PI is used as the denominator in KPI Passenger injury ratio.
4.62 Planned unavailability
4.62.1 PI Definition
The number of hours planned for repair and maintenance, including Class renewal surveys, Intermediate surveys, Dry dockings and Modification jobs that are agreed between the ship manager and the charterer/vessel operator.

4.62.2 PI References
No external reference is made for this PI.

4.62.3 Used in KPI(s)
- Vessel availability

4.62.4 Measurement Units
Hours planned unavailability

4.62.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.62.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.62.7 Numeric example
Hours planned unavailability = 18

4.62.8 PI Context
This PI is used in the KPI Vessel availability. To be able to measure a vessel’s availability it is natural to subtract the planned unavailability from a total potential availability (typically 365*24) as it is the unplanned unavailability that is given focus.

4.62.9 Misc
The planned unavailability should be taken from the agreement between the parties valid for the reporting period, in this case the rolling 12 months. This means that if the agreement is changed during the year the value for planned unavailability may change over the year.
4.63 Total exposure hours

4.63.1 PI Definition
TEH is the aggregated total number of hours all crew or any person being part of the vessel's complement (e.g. officers, ratings, cadets, superintendents) have spent onboard the vessel.

4.63.2 PI References
No external reference is made for this PI.

4.63.3 Used in KPI(s)
- Lost Time Sickness Frequency
- Lost Time Injury Frequency
- Crew disciplinary frequency

4.63.4 Measurement Units
Crew days * 24

4.63.5 Time Period for data capture
Captured for a one year rolling time period and reported on a quarterly basis. When reporting the PI Value for 2009/Q2 the time period for the data capture should be 2008-07-01 to 2009-06-30.

4.63.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level. Each vessel should be given its unique PI Value on this PI.

4.63.7 Numeric example
3750 Crew days * 24 hours = 90 000

4.63.8 PI Context
This PI is used as a denominator in several KPIs enabling benchmarking of vessels with varying number of crew onboard.

4.63.9 Misc
When capturing data you need to aggregate the number of crew days over the 12 month period and multiply be 24. The small error of crew members embarking and disembarking and giving rise to fraction of days is disregarded.
4.64 Transport work

4.64.1 PI Definition
Transport work is a product of the cargo transported and the distance sailed with that cargo.

4.64.2 PI References
No external reference is made for this PI.

4.64.3 Used in KPI(s)
- CO2 efficiency
- NOx efficiency
- SOx efficiency

4.64.4 Measurement Units
Cargo unit-mile.
Cargo units are: Ton, cubic meters, number of units, lane meters, TEUs etc

4.64.5 Time Period for data capture
Captured and reported on a quarterly basis. The transport work must be calculated per leg: Number of units carried multiplied with the distance sailed for that leg. All legs are then aggregated to find the total transport work for that specific quarter.
When reporting the PI Value for 2009/Q1 the time period for the data capture should be the first quarter of 2009; 2009-01-01 to 2009-03-31. Count up until the last port call in the relevant quarter.

4.64.6 Vessel/Fleet measurement
This PI is to be reported on a vessel level.
Each vessel should be given its unique PI Value on this PI.

4.64.7 Numeric example
Ton miles: Loaded cargo x distance sailed = 20 710 647 000

4.64.8 PI Context
This PI is used as a denominator in KPIs related to emissions in order to express emission efficiency (related to CO2, NOx and SOx). Emission efficiency is how much emission is generated while transporting one cargo unit one mile.

4.64.9 Misc
As the PI is an aggregation of all laden legs, ballast legs do not come into consideration. Transport work given as ton-miles may for some shipping segments not be considered applicable measure and IMO opens for the usage of different units of measure. (Container Ships: TEU (empty or full), Passenger vessels: passengers, Car Carriers: car units or occupied lane meters). Allowing for different cargo units to some extent impedes the benchmarking ability as it becomes difficult to compare different vessel types, but it strengthen the coherence of measurement of vessel carrying the same cargo type/units. This is not suitable for the KPI if it is to enable comparison between modes (e.g. bulk vs. containers).