Expectations / Priorities as Cruise Line Operator:

Sea Traffic Management must contribute to:

- Safety of navigation
- Increase of fuel efficiency
- Reduction in emissions
- Improvement of shore based support
- Risk mitigation of potential delays and congestion at highly frequented ports
Status Quo of shore based fleet-monitoring in the cruise industry:

Several Cruise Lines (e.g. AIDA Cruises, Costa Crociere) operate Fleet Operation Centre’s, providing:

- 24/7 fleet monitoring
- Shore based route planning
- Decision making support for Captains in non-routine situations
- Shore based support for all routine operational situations
- Integrated real time corridor monitoring within the verified safety corridors
• Established May ‘2012
• 24 hrs. / 7 days a week operation
• manning (7 Operators)
Current Technical Solution

SHIP

- Water tight doors
- Engine data
- Fire detection
- Stability
- Etc.

VDR

Satellite transport layer

All others

VDR player enhanced with corridor function

SHORE

NMEA Out via Network And serial interface

MFD1

MFD2

MFDn

Shoreside ECDIS for monitoring
General System Overview

Planning Process / Route Activation

Data Collection

Monitoring / Alerting

Onboard NAPA and SMS Monitoring systems already installed

Alerts Mgmt: Visualization Notification Despatching (Mail, SMS, Call)

Real Time Monitoring & Alerting: Navigational Data Automation Data NAPA Data Martec Data Alerts

VPP & Corridors Checked by FOC

VPP & Corridors Checked by Captain

Route Deviations Generation Visualization

Navigational Data:
- GPS Position
- Heading
- Speed
- AIS
- Radar Images...

Automation Data:
- Engine
- Rudder
- Generators....

Martec Data:
- Fire Doors
- Smoke detectors
- WT Doors

Shoreside Data Collector

Fleet Monitoring DB

Reusable Data Collector

VPP NMEA data

VDR -> MDE

Integrated Fleet Monitoring System

NACOS
- Navigation

Shipborne EDIS PS

Shipborne Route DB

Shoreside Route DB

Shipside ECDIS PS

Shoreside Data Collector

VPP & Corridors Checked by FOC

Monitoring & Alerting Historical and Live Data:
- Navigational Data
- Automation Data
- NAPA Data
- Martec Data
- Alerts

SMS

SMS

Unified Data Collector

Automation

SMS

Alerts Mgmt:
- Visualization
- Notification
- Despatching (Mail, SMS, Call)

Real Time Monitoring & Alerting:
- Navigational Data
- Automation Data
- NAPA Data
- Martec Data
- Alerts
• Monitoring Safe Passage Corridors
• Triggering Alarms (Passage Plan / Corridor breach / CPA / UKC / Delays etc.)
• Indication of certain parameters (Cruise Info, Meteo Info, Propulsion Info etc.)
• Radar & Ahead view webcam
- Saving NMEA data for 4 months
- Saving Radar / Voice data for 7 days
• Redundant Onboard NAPA – System installed in the FOC
• Assigned stability data can be recalled and followed up ashore
FOC – Tools

ABB EMMA System (Ship Energy Manager)

- Monitoring / Storing of fuel consumption parameters / KPI
- Optimization of vessels energy efficiency
FOC – Tools
Shore based Logbook

- Keeping record of all kinds of incidents
- Tracking operational variation and sub-summing associated costs
- KPIs & Trending possibilities
FOC – Tools

FACT 24 (Emergency Notification Tool)

- Alarming & Informing all necessary parties about incidents via automatic telephone call
- within Seconds the Emergency Response Team can be activated
FOC – Crisis Management Interaction

- FOC operating as a link between the involved parties

- Single point of contact for company vessels in case of crisis or incidents

- Setting up and preparing software and hardware of the Emergency Response Centre (ERC)

- Maintaining continuous communication to the vessel

- Providing Emergency Response Team (ERT) with immediate information of the status and assisting as required
<table>
<thead>
<tr>
<th>Day-to-day Operation</th>
<th>Long-term itinerary planning</th>
<th>Crisis Management</th>
<th>Ancillary duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Nautical support (SOLAS, Water tight doors; Port Risks, Baselines, Waters, Firing Areas, etc.)</td>
<td>• Itinerary Calculations</td>
<td>• Initial point of contact in a crisis situation or real emergency</td>
<td>• For events (e.g. Ship Christening, Charters, Port Events) pre-planning and coordination of nautical tasks in cooperation with simulator training centre</td>
</tr>
<tr>
<td>• Dealing with carrier delays (flights / trains / busses)</td>
<td>• Itinerary Optimisation</td>
<td>• Activation of ERC</td>
<td></td>
</tr>
<tr>
<td>• In touch with lock masters &amp; pilots</td>
<td>• Port Risk Assessments (nautical risk incl. on-site surveys)</td>
<td>• Integral part of emergency response</td>
<td></td>
</tr>
<tr>
<td>• Support in weather forecasts (twice per day wind / swell forecast)</td>
<td>• Providing support in economic and efficient routing/corridors</td>
<td></td>
<td>• Ships Certificate Central Management</td>
</tr>
<tr>
<td>• Getting Senior Management informed in case of incidents &amp; operational disturbances</td>
<td>• Charter Requests (special sailing routes; formations; etc.)</td>
<td></td>
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</tr>
<tr>
<td>• Re-routing (due to weather issues, ports security issues, etc.)</td>
<td></td>
<td>• Assisting in Medical Helicopter disembarkations</td>
<td>• Maintaining database / record keeping (FOC Logbook)</td>
</tr>
<tr>
<td>• Monitoring safe passage corridors</td>
<td></td>
<td>• Assisting in investigations</td>
<td>• First point of entry entry for Stability (NAPA) queries</td>
</tr>
</tbody>
</table>

FOC - Main Tasks
24 hrs. nautical operations department
FOC – Future Organizational Outlook

SAM Electronics
- Upgrading ECDIS by proprietary Corridor Telegram

Corridor Exchange

Crisis Management

ABB
- Commissioning of flow meters
- EMMA system

Fuel Monitoring & Optimization

FOC

PAX Control (flights, trains, busses)

Technical Condition monitoring

INTERSCHALT
- Developing a MDE (Maritime Data Engine)
Diagnostic Tool - Basic structure of a Nautical Task Management Monitoring
Components of the solution

NAUTICAL TASK MANAGEMENT

Mathematical model and methods

Knowledge base

Mathe
matical Prepro-
cessing

Merging and testing

Sensor data

Ship's Parameter

Manual inputs and fine-
justing

aboard or ashore

Data Concentrator

Voyage Data Recorder

MER
• 24/7 traffic monitoring and sea traffic management
• weather routing
• corridor and timeslot allocation to dilute traffic density
• port approach coordination to avoid congestion and delays
• improvement of safety of navigation by high level aggregation and risk evaluation of traffic data (e.g. Nautical Task Monitor by Dr. D. Kersandt)
• coordination of seaside and shore based resources for SAR activities
Thank you for your attention!