Challenges of the ongoing transformation from manual driven machines to automatic machines.

Advanced Driver Assistance Systems (ADAS) for Cranes in Container Terminals

Carsten Wiesen
- Sales Manager Asia-

LASE Industrielle Lasertechnik GmbH
ADAS are systems to help the driver within the driving process. Terms and allegoric from the automobile industry for ADAS:

<table>
<thead>
<tr>
<th>System</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Cruise Control</td>
<td>ACC</td>
</tr>
<tr>
<td>Tire pressure monitoring systems</td>
<td>TPMS</td>
</tr>
<tr>
<td>Intelligent Speed Adaption</td>
<td>ISA</td>
</tr>
<tr>
<td>Intelligent Parking Assist System</td>
<td>IPAS</td>
</tr>
</tbody>
</table>

Advanced Driver Assistance Systems (ADAS) are systems developed to automate/adapt/enhance vehicle systems for safety and more efficient driving.

In this presentation we concentrate on assistance systems for a safer handling of the load by container cranes!
How do these things happen?
Accident rates by containers, kicked down from the stack into the truck lane:

- 75% in the operation bay
- 25% in the adjacent bays
How do these things happen?
How do these things happen?
All these accidents caused by mistakes of humans:

1. We miscalculate situations/distances!
2. We are getting tired after working long hours!
3. We are distracted by colleagues!
4. Sometimes, we do stupid things!

**Advanced Driver Assistance Systems** help crane drivers and remote operators do their work properly and cause no harm!
ADAS – 2D/3D Load Collision Prevention System for Stacking Cranes

Features & Benefits:

- **Collision prevention** between the load and the containers in the yard (in operation- & in the adjacent bay)
- **Soft-landing** – less spreader wear and less noise emission
- **Optimal curve drive** (saves operation time & increase productivity)
- **Enhanced the Support for remote operations**
- **SIL 2 Certification, Performance Level D** - possible

![No collision!](image1)

![Risk of collision!](image2)
ADAS
LaseLCPS-3D-2D – Load Collision Prevention System-3D-2D

Product of LASE Port Solutions
LaseLCPS-3D-2D - Load Collision Prevention System - 3D-2D
ADAS - Load Collision Prevention System for STS-Cranes

Features & Benefits:

• Collision prevention between the load and stacks on the vessel
• Soft-landing – less spreader wear and less noise emission
• Optimal curve drive (saves operation time & increase productivity)
• Enhanced Support for remote operations
• Exact thread in cell-guides – with fast approach
• Vessel longitudinal shift detection
ADAS
LaseLCPS-STS – Load Collision Prevention System-STS

Product of LASE Port Solutions
LaseLCPS-STS-3D - Load Collision Prevention System-STS-3D
ADAS – Truck Lifting Prevention System

Features & Benefits:

- Prevention of accidental picks of truck and trailer
- Safety for the workers and material
- Fast detection by object tracking
- Accurate tracking of object position (trailer and container)
- Easily adaptable also for retrofitting for all truck-trailer types
ADAS
LaseTLP – Truck Lifting Prevention

Product of LASE Port Solutions
LaseTLP - Truck Lifting Prevention
Benefits of Advanced Driver Assistance Systems!

- Safety first !!!
- Higher automation
- Increased productivity
- Reduced labor costs
- Low maintenance