AMS – Innovation for more Safety and Efficency in Container Handling.

An Important Step for Automated Container Handling

Bromma is a global market leader in the development and sale of spreaders, which are used for lifting and transporting ISO standardised containers in ports and transhipment stations. The company portfolio also includes other machines and tools required for container handling, such as the Automatic Lashing Platform, an innovative system that enhances the portfolio.

Starting Point
An ALP is a complex machine for the automatic fitting and removal of locks (twist locks) on containers, in order to fasten them together and be able to stack them on the container ship. These days this task is usually carried out manually underneath the suspended container or on the trailers under the crane. This obviously presents a high risk of injury for the staff carrying it out, as this working position is one of the most dangerous on a container terminal. Bromma has now automated this process by developing the ALP in order to reduce the risk of injury to the dockworkers and allow a reduction in staff deployment in the danger zone underneath the container crane. Bromma is so far the only provider that offers an automated machine based solution for this process.

Challenge
In order to complete its ALP offering and to integrate the ALP into the operational and technical process of a terminal, Bromma planned a central, remote controlled system for the monitoring and operation of all ALPs in a terminal. In order to master the technical challenge of integrating a machine into the operational processes by means of software, Bromma found two knowledgeable partners (ISL Applications and akquinet) with practical experience in this field of logistics and software, and set up the project at the start of 2016.

At a Glance:
- **The AMS Automatic Lashing Platform Management System manages the operational control and planning of the automatic twist lock handling**
- **Remote control and monitoring as a key function for ALP Automatic Lashing Platforms**
- **The AMS improves container handling safety and efficiency**
- **Bromma expands its market position for ALPs with a control system, integrating it into the operational and technical processes**
- **Open system Java technology and JBoss EAP middleware**
- **High quality standard by using an emulation based test bed**

Solution and Implementation

The project started in January 2016. As the technical consultant and project manager, akquinet took responsibility for analysis and design, as well as development and implementation of the AMS. ISL Applications contributed simulation results and simulation experiences to the requirements analysis. Together with Bromma and ISL Applications the requirements were first specified and the resulting future processes and functionalities were defined.

Akquinet implemented an AMS for Bromma with which the operations centre and container crane operator are able to remotely monitor and control one or more ALPs. Furthermore, the application provides the technical division of the terminal with the opportunity to conduct monitoring, including the integration of ALP cameras via live-stream. The architecture also enables technicians using the application via mobile devices. The application is based on Java technology and JBoss EAP middleware. It controls and monitors the ALPs from a browser. The machine is controlled via a PLC (Programmable Logic Controller), regardless of manufacturer. A PLC by Siemens is used by Bromma, which the application connects to on every ALP. The server application runs on a Windows server system, but is not limited to this Operating System. The implementation also included an interface to the ISL simulation application CHESSCON for testing and training.

The container crane operator or dispatcher logs in to the AMS application via the browser and gets an overview of all connected ALPs displayed on a dashboard. By selecting an ALP, a detailed view of the ALP is shown. The status of the machine and all eight corners of the ALP are displayed. Camera live feed information can also be accessed.

The operator receives detailed error messages and also sees the fuel and battery level of the machine. The crane operator as well as the supervisor can interact with the ALP and manage it remotely using the application. The project was successfully completed in June 2016 with the introduction and training of Bromma employees. As a further development, the integration of the AMS into a TOS Terminal Operation System and an asset management would be conceivable,

in order to monitor and control container handling from just one central platform. Furthermore, planning components may be added to forecast the operation and manage the ALP allocations to the cranes in an effective way.

Lars Meurling, Vice President, Marketing, Bromma:
„The akquinet / ISL team has the necessary industry specific expertise and was able to narrow down our initially rather open-ended requirements quickly and in a focussed manner. Thanks to their experience with machine control projects and good project management, akquinet implemented the AMS within the schedule and on budget, to our complete satisfaction. The application is easy to operate and runs very safely. With the aid of this application we will be able to further expand our leading position for ALPs."

Benefits for Bromma:
- **The AMS makes Bromma's ALP a marketable, all-in-one solution**
- **Bromma offers customers unique added value for container handling**
- **The AMS is clear and simple for container crane operators to use**
- **Seamless integration into technical and operational processes**
- **Bromma further enhances its role as a leader in ALPs**