SUCCESS STORY

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ENSCO Deploys Basler sprint and ace GigE Cameras for Comprehensive Railway Track Inspection

Customer

- Name: ENSCO, Inc.
- Location: Springfield, VA
- Industry: Quality inspection for the railroad industry
- Year of Realization: 2011

Application

ENSCO is a leading provider of track inspection systems to the global railway industry. These systems are deployed on dedicated track inspection vehicles and provide non-contact inertial and laser based measurements of various parameters related to the geometry of the track and wear condition of each rail. The measurement systems are capable of reliably identifying track maintenance and safety issues. However, railways also still require human interaction to conduct visual routine track inspection patrols to identify conditions not measured by these traditional technologies. The use of people to inspect track has been relied on throughout the history of railways, but there are several limitations to this approach.

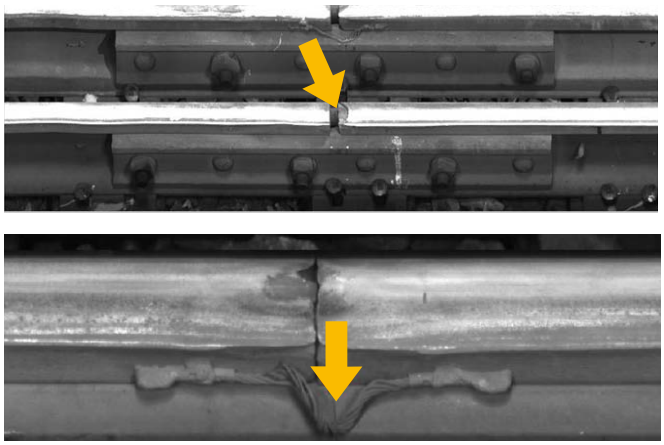
The patrols are often performed from hi-rail platforms (i.e. road vehicles modified to traverse a railway) which limit the ability of a track inspector to visually identify small defects in rail components or ties (sleepers). Furthermore, as railway traffic continues to increase around the world, there are often limited track availability time windows for inspectors to perform these patrols. This creates pressure to inspect as many aspects of the track as possible in the least amount of time on the track. This historical challenge has produced significant demand around the world for adding video inspection technology to help further enhance current measurement technologies and manual track inspection patrols. Use of video technology enabled with machine vision processing provides the opportunity to perform more detailed inspections at higher speeds both on the track and in the office, ultimately delivering a comprehensive solution that maximizes the efficiency of available time on track.

Solution and Benefits

In response to the demand for video track inspection technology, ENSCO has developed three key video inspection technologies to extend their automated track inspection portfolio. They are using Basler sprint and ace GigE cameras in their inspection systems:

Automated Joint Bar (Fish Plate) Video Inspection System

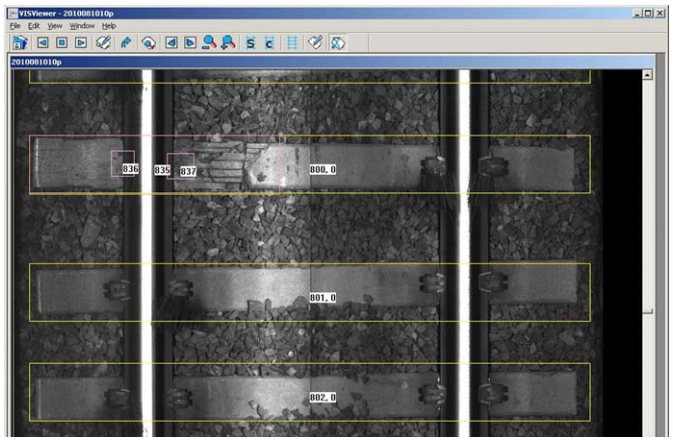
This system utilizes Basler sprint cameras to provide high resolution imaging on the web of the rail coupled with machine vision algorithms to detect the presence of a rail joint bar and automatically inspect the bar for cracks or excessive gaps in the rail.



View of the Rails as Provided by Joint Bar Video Inspection System. Overview (Upper Image) and Detail With Crack (Lower Image).

Roadbed Video Inspection System

The system utilizes Basler sprint cameras to provide high resolution imaging of the track roadbed for office review and automated machine vision processing to detect such conditions as failed ties (sleepers), missing fasteners, or poor rail surface conditions.



Screenshot of the Video Inspection System Showing an Image of the Roadbed

Right of Way (Driver View) Video Inspection System

The system utilizes Basler GigE ace cameras to provide images of the railroad right of way for visual office processing of poor conditions such as excessive vegetation or poor drainage conditions

Images of the Railroad

The combined use of these video inspection technologies is highlighted in the development of ENSCO's latest Comprehensive Track Inspection Vehicle which commences North American testing services in the fall of 2011 on transit, Class 1 freight and regional railroads. This vehicle not only features each of the video inspection systems identified above using Basler technology, but also a track geometry, third rail and rail wear measuring systems to provide a highly comprehensive and efficient approach to track inspection.

Basler sprint

Basler ace

ENSCO's Comprehensive Track Inspection Vehicle

ENSCO has selected the Basler product lines for important technology applications for several key reasons:

- High line rates on the Basler sprint cameras allows the application to work with a velocity of the inspection vehicle of up to 120MPH
- The ability of the Basler sprint cameras to expose and transfer data at the same time doubles the sensitivity at full frame rate
- The dual line and binning configuration of the Basler sprint allows the same hardware to operate in a high sensitivity or high resolution application depending on the required inspection speed
- Basler sprint cameras offer drop in color upgrades for product scalability
- Basler ace GigE cameras were a great option in replacing legacy Firewire cameras in the Right of Way application offering a low cost, high end camera that's easy to work with.

Technologies Used

- Basler sprint cameras (spL2048-70km)
- Basler ace GigE cameras (acA1300-30gc)
- Bitflow neon CLD frame grabbers
- Custom line scan lighting solution
- BEI Encoder mounted on rail wheel
- Computing rack with several multi core PCs
- Custom C++ software for acquisition and distributed inspection

More Information

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