

## PRODUCT APPLICATION NOTE

**WA0606**

<b>Industry:</b>	Bulk Material Handling
<b>Application:</b>	Collision Avoidance
<b>Optech Equipment:</b>	4 Watchman 3100
<b>Application Description:</b>	Automated ship-to-boom collision avoidance.

In an effort to improve efficiency and safety at one of the busiest deep-sea ports in North America, an engineering firm, specializing in the design and integration of equipment, recently completed a pilot project involving the retrofit of Optech's Watchman 3100 laser position indicators to the loading chute platform of an existing boom spreader. The system must provide automated spotting of the loading arm, servo control of the arm throughout loading, and redundant collision avoidance. The pilot application was used on a 10,000 t/hr coal loading platform and the lasers were required to operate in a Class 2 Group E, F and G atmosphere.

In total, 4 Watchman 3100s were employed in automating the loading arm. These were used to centre the arm over the loading hatch, and also to monitor the depth of the chute as it projects into the ship's cargo hold. Laser's inherent ability to measure to diffuse surfaces at oblique angles, coupled with real-time data output, makes ship-to-boom collision avoidance fundamental to the system's design.

Data is fed closed loop from the laser via a PLC into the boom spreader logic, where spotting the loading chute is now rapid and completely automated. The Watchman 3100s are able to not only read the ship deck, but also directly to the material being loaded. This in itself can present a challenge due to the dust created while loading various types of low sulfur coal, as well as under heavy rain and fog conditions. The 3100's unique signal processing is specifically designed for these conditions.

Since being put into service, the pilot operation has not only improved safety but also increased efficiency. By keeping the loading arm as horizontal as possible during loading, conveyor drive motors consume a small fraction of the power required at maximum inclination. In addition, the fugitive emissions resulting from escaping dust are minimized, as the chute position can be maintained very close to the coal pile, with the pile formation (regardless of cone geometry) and draft of the ship being accurately measured and monitored at all times.

### KEY ADVANTAGES OF LASER TECHNOLOGY IN OBJECT POSITIONING

- Measurements can be made in dusty conditions with the use of reflectors on targets.
- Non-contact measurements.
- Short set-up time and easy calibration.
- Narrow beam divergence for long distance measurements to small targets
- Measurements unaffected by temperature variations.

300 Interchange Way • Vaughan, ON • Canada L4K 5Z8

Tel: [905] 660-0808 • Fax: [905] 660-0829

Web: [www.optech.ca](http://www.optech.ca) • Email: [inquiries@optech.ca](mailto:inquiries@optech.ca)