

**Case Study: Siemens MiniRanger Level Transceiver  
and Echomax XPS-10 Ultrasonic  
Transducers**

**Application: Automating Ship Unloading  
Great Lakes Ore Ship**



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**Problem** With the cost of fuel on a steady rise, and operating expenses increasing, this customer looked to automating its processes as an effective way to keep costs in line.

The objective was to keep the boat hauling ore, not tied up at the dock unloading.

The customer also needed to be aware of health concerns, as people who worked in the unloading tunnels were exposed to excessive dust.

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**Current Business Result** The rate at which a ship can be unloaded is normally dependent on the ability of operators in the tunnel to maximize ore flow control. They do this by manually manipulating the opening of the hold gates. These gates control the dumping of ore from the ship's holds onto a conveyor belt, which is then used to unload the ship. Too much flow and the belt overflows, and product spills. Too little flow and the unloading time is increased.

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**Solution** The customer installed Siemens ultrasonic instrumentation to measure the level on the conveyor belt, as well as the size of the opening on the unloading gates. Belt level data and gate opening size, coming from the level transducers, is fed into a PLC.

The PLC determines optimum size of the gate opening and returns a control signal to an electric operator that opens the gate for the optimal allowable flow rate on the belt.

The ship was originally designed to unload ore at 6,800 tons per hour (TPH). By automating the hold gates to optimize belt loading, the unload speed was increased to 9,200 TPH, and removed four operators from the tunnel.

Manpower savings calculated out to about a **half-million dollars per year**. Plus, the ship is able to make four or five more trips per year because of the time saved in the unload process. These additional trips are valued at about a **million dollars per year in additional revenue**.

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**Customer Comment** **We're putting this system on all of our new boats. And, we'll be retrofitting a lot of the existing boats with this system. It's a great way to make them more efficient!**

**Interested?** Want to learn more about Lesman's bulk solids level solutions? Visit [www.lesman.com](http://www.lesman.com), call 800-9LESMAN (800-953-7626), or send an e-mail to [sales@lesman.com](mailto:sales@lesman.com).