



A Rockwell Automation Company

## BC Ferries - Horseshoe Bay Active Lift System

### The Client:

On June 15, 1960, BC Ferries started with two ships, two terminals and approximately 200 employees. Today BC Ferries has 40 vessels, serves 46 destinations and employs over 4500 individuals. BC Ferries is serving the coastal communities with one of the largest and most sophisticated ferry systems in the world.

With an increase in tourism and migration to the islands,

BC Ferries is continuing to retrofit, expand and make the terminals safer and more efficient. As part of this expansion, progress and public safety, Hinz has been providing BC Ferries with engineering solutions for projects at the Tsawwassen, Horseshoe Bay, Departure Bay and Swartz Bay Terminals

### The Requirement:

This project required retrofitting the ramp and installing a prototype "Active Lift System" at Berth #1 in the Horseshoe Bay ferry terminal. The retrofit was done to accommodate the loading and unloading of high-speed catamaran ferries.

This project involved removal of the old counter weight system for lowering and raising the ramp. Hinz's responsibility included design and commissioning of a

new power distribution system, control system traffic lights, operator cabs, PLC programming for the hydraulic system control and safety monitoring.

Hinz's first project with BC Ferries was to design the PLC based safety monitoring system for berth #3 in Tsawwassen. This prototype design was used as the design basis for this project.

### The Design Solution:

Hinz provided a complete electrical and controls engineering solution, including the selection of major electrical and controls hardware, detailed electrical/instrumentation/controls design, equipment specifications, PLC/HMI programming, installation supervision and commissioning.

The control system consisted of an Allen-Bradley 5/04 processor with racks and I/O modules mounted in a cabinet and a Hewlett-Packard computer/monitor for HMI and PLC programming. A control console complete with push buttons and pilot lamps was used to interface to the field devices for controlling and monitoring the ramp and traffic barriers.

Some of the following devices were used for monitoring the system: tide level sensor used to automatically lower and raise the ramp with the movement of the tides, proximity and photo switches installed under the apron to ensure the apron is resting on the ship's deck, inclinometers to monitor the ramp and apron incline for raising or lowering the ramp while the ship is being loaded, pressure and linear positioning transmitters for control of the ramp hydraulic system, CCTV to monitor traffic patterns, vehicle over-height sensors, flashing beacons and traffic lights.

For maintenance personnel and passenger safety, the entire control system was designed using 24 VDC. The existing power distribution at the terminal was 480V, however the catamaran design was 600V. This required the design/installation of 300kVA transformers from 480V to 600V to power the catamarans.

To prevent the risk of having the ramp/electrical equipment sit in the water at high tide during a power failure and to be able to load and unload the ferries during a power failure, all of the ramp operations equipment is fed from a 500kW emergency generator, .

All of the site distribution is underground except for cabling that is mounted on the ramp to service local equipment. The power system design included the design of the 480V ship to shore panels and distribution for the existing ferries, the 600V ship to shore panels and distribution for the new high-speed catamarans, soft-starts for motors 40 HP and larger, electrical room equipment layouts, power distribution single line diagrams, motor control schematics, ramp equipment layouts, 600V MCC design, and the lighting and receptacle layouts.



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### System Specifications:

- Allen Bradley SLC 5/04
- RSTools Visual Basic Application used as the Operator Interface

For further information or to contact a Hinz office near you, please check our website at:

[www.hinz.com](http://www.hinz.com)