

Brookfield Renewable U.S. Lower St. Anthony Falls MultiFunction Boom Series

MINNEAPOLIS, MINNESOTA



CASE STUDY

ICE AND DEBRIS BOOM EXCLUSION

Lower St. Anthony Falls Lock and Dam is an 8.98 MW project on the Mississippi River in the heart of Minneapolis, Minnesota. With a head of approximately 25 feet, this site includes a 275-foot-long concrete spillway on the north side of the river, a single operating lock along the south riverbank, and between them a 56-foot-wide auxiliary lock chamber. The turbine-generator assembly located downstream of the auxiliary lock Tainter gate consists of sixteen (16) matrix units in a stacked arrangement and equipped with integral trash screens. The trash booms previously used at this site were unable to prevent waterborne debris and ice from periodically overwhelming the matrix unit trash screens and interrupting operation of the hydropower units. As a result, the facility suffered from numerous debris- and ice-induced shutdown incidents. This led to losses of thousands of megawatts and increased maintenance and operations costs.

Brookfield Renewable U.S. is a leading global alternative asset manager focused on investing in long-life, high quality assets including renewable power. In June 2018, they turned to Pacific Netting Products for help customizing a MultiFunction Boom that could protect the St. Anthony Falls facility from ice and debris and reduce generation losses.

The boom is fitted with a debris skirt designed to guide ice and debris during normal conditions. On the lock side, the MultiFunction Boom is built with custom features including a swimmer self-rescue ladder and a steel grate safety walkway. All other boom sections are joined together by flange-bolted connections. Upstream, the MultiFunction Boom is attached by a chain bridle to an impact-absorbing, unsinkable, custom-designed, foam-filled composite anchor buoy.

KEY FEATURES

- 225 foot length overall
- 36 inch Class 1 boom with 346,000 pounds safe working load
- 9 sections, "V" shape design
- Main sections flange-bolted
- Fitted with both debris skirt and splashguard
- Custom swimmer safety ladder
- Walkway grate on one boom section
- Designed for 10 feet / sec flow
- Anchored by heavy-duty in-river cored concrete pile, flush to riverbed, connected by chain to 8 ft x16 ft anchor buoy
- Year-round deployment

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