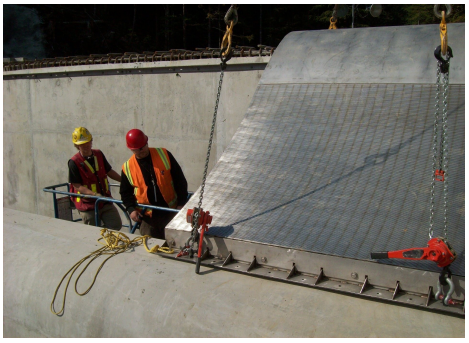
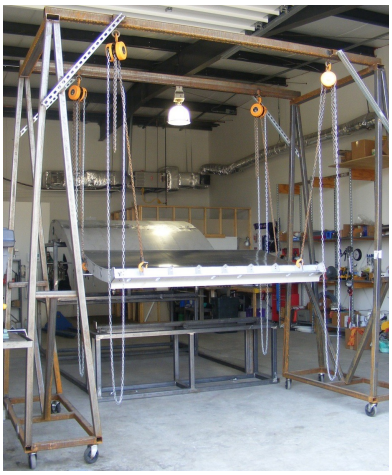
COOK LEGACY CASE STUDY

Fitzsimmons Creek Coanda Effect Screen

Industry	Power Generation
Problems	Obtaining environmentally friendly, maintenance-free intake screens to generate green energy for the 2010 Winter Olympics.
Solutions	Cook Legacy, collaborating with Norris Screen™, designed and built Coanda Effect screens.
Result	Providing the power supply at the 2010 Winter Olympics in Whistler, British Columbia.

When the need arose to provide green energy on Fitzsimmons Creek in British Columbia, Cook Legacy and Norris Screen partnered to design and build ten Coanda Effect screens. The screens' unique slanted wedge wire construction allows layers of river water to be "sliced off" while flowing over the screen. The water falls through the screen and is diverted to a turbine and power station. The remaining water flows downstream with any debris, minimizing maintenance. Additionally, the smooth screens are "fish-friendly" — further reducing the footprint of this run-of-river hydro project.





COOK LEGACY CASE STUDY

Industry	Municipal Water
Problem	Update and retrofit of Municipal Water Plant to increase site capacity. The system piping and wet well were too small for the upgrade, leaving a very low tolerance for clogging on the screens.
Solution	Cook Legacy developed a custom air burst system to clean the screen. In order to ensure that the system had full capacity the air burst system was set to provide a burst of air based upon a timer, a push button, or a signal from the system SCADA indicating a drop in the wet well level.
Result	System is operable without structural modifications to the wet well.

Air Burst System for Municipal Water

Air Burst System for Municipal Water

A water treatment plant was updating its capacity. One major component of this upgrade was doubling the intake capacity of the systems. Although the screens were properly sized to account for the upgrade (they were developed by Lee Cook in 1997) the physical system including the wet well was not. As such there was no room for clogging or loss of capacity within the system. Cook Legacy developed an airburst system which integrated with the plant's SCADA system to provide a cleaning burst whenever water level dropped. The system was also flexible, and allowed for timer initiation, or initiation via an onboard touch screen.

COOK LEGACY CASE STUDY

Industry	Power Generation
Problem	Power plant cooling water intake system had to be modified for better performance, to halt zebra mussel attachment and to comply with EPA Regulations.
Solution	Passive screen system was designed and sited with the right dimensions and location to minimize adverse environmental impact. Screen was coated with Jacquelyn™ Corrosion and Zebra Mussel Resistant Coating.
Result	Improved water quality at intake. System was permitted with the appropriate screens and is now in successful operation. Cook Legacy modifications to screen saved 25% over standard wedgewire intake design.

Custom Cooling Water Intake System

Cooling Water Intake Systems

Cook Legacy Intake Screens are effective for cooling water systems for power plants and other facilites. Cook Legacy developed the Cooling Water Intake Screens for a power generating facility in Wisconsin. The site included several challenges, including environmental concerns, zebra mussel infestation, damage to the existing pipe, and the system was going to be placed in a high traffic area. Cook Legacy used flow modification to define the velocity profile of the screen and avoid environmental damage. The zebra mussel problem was addressed with patented Jacquelyn™ Coating. Cook Legacy developed a screen geometry that allowed it to be easily installed within the existing system while maintaining a low profile to avoid boat traffic.

COOK LEGACY CASE STUDY

Industry	Power Generation
Problem	A new intake system was being built in an area infested with zebra mussels. The system had no tolerance for diminished flow so they had to ensure that the intake pipes remained free of zebra mussels.
Solution	The ID of the piping was coated with Jacquelyn™ Coating. This was significantly less expensive than using pipe built of an antifouling material.
Result	Reduction of capital, operating, and maintenance cost for the facility.

Jacquelyn Coated Pipe

Jacquelyn™ Coated Intake Pipe

A power plant was retrofitting its cooling water intake system to comply with EPA Regulation 316(b). The engineers were concerned because the water body they were drawing from was infested with zebra mussels. In addition, the flow rate through the system was going to be decreased to a flow rate which is optimal for zebra mussel growth. The facility needed to maintain ample cooling water to avoid costly thermal discharge penalties or even a system outage. Cook Legacy used Jacquelyn™ Coating to address these concerns. Using our ASME Certified fabricators we built the pipe and applied Jacquelyn™ Coating to the ID of the intake pipe array. This application led to a significant reduction in capital cost over the use of exotic material such as 90-10 CuNi for the piping.

COOK LEGACY CASE STUDY

Industry	Cooling water
Problem	An island resort had a large water intake system for cooling water and as backup for a fire control system. These functions were essential but the water was full of all forms of aquatic life, including biofouling. The system had to be rapidly removable so that it was not destroyed during the annual hurricane season.
Solution	As one component of a custom designed intake solution, Cook Legacy used Jacquelyn™ Coating on wedgewire panels to exclude aquatic life while eliminating biofouling.
Result	The system eliminated biofouling on the screens and was easy to install and remove.

Retrofit of an Intake Screen for Antifouling Performance

Antifouling Intake Screens

Warm, clear, water and a constant summer are a perfect scenario for a lovely vacation destination. They also create significant design challenges such as aggressive biofouling. Cook Legacy worked with a resort owner at an island resort to retrofit his existing intake system (an offshore strainer) with a new passive screen system. Cook Legacy worked with the site owner to develop a custom flow modifier within the system to ensure consistent flow, and to make the screens so they could be easily installed and removed. To address biofouling concerns Cook Legacy coated the screens with Jacquelyn™ Coating.

COOK LEGACY CASE STUDY

Industry	Chemical
Problem	High maintenance and debris handling costs, long outages, frequent replacement of vertical traveling screens.
Solution	Retrofit to passive screen system with wedgewire screens. System was mounted on a bulkhead to slide into existing traveling screen canal.
Result	Improved water quality at intake. Reduction of operating and maintenance cost. Eliminate need for outages every 5-7 years.

Retrofit of Vertical Traveling Screens

Retrofit of Vertical Traveling Screens

There is often a significant value of retrofitting vertical traveling screens with Cook Legacy type screens. In one instance, three chemical processing locations retrofit their vertical traveling screens. The vertical traveling screens at these locations required significant annual maintenance and rework. Every 5 – 7 years the vertical traveling screen machines had to be totally replaced. Working with the facilities engineers and consultants, Lee Cook designed the screens and bulkheads to drop into the concrete slots for the vertical traveling screen machines. The vertical traveling screens were pulled and replaced with the new passive intake screens. The process of retrofit of the screens was dramatically faster than previous experience in the removal and re-installing the vertical traveling screens. Operating and maintenance requirements of the intake system have been eliminated. This includes power to run the screens, consumables, screen maintenance, and debris handling requirements. The need for replacement every 5-7 years has been eliminated. In addition, the reduction in time related to the retrofit allowed the facilities to come back to full production days earlier than they had with the vertical traveling screens. Engineers for the facilities report that because of the increased productivity and shortened time out of service the payback period for the retrofit was instantaneous.

COOK LEGACY CASE STUDY

Industry	Chemical
Problem	High maintenance and debris handling costs, poor water quality
Solution	Retrofit to passive screen system with wedgewire screens
Result	Improved water quality at intake. Reduction of operating and maintenance cost. Project payback of 2 years.

Retrofit of Offshore Intake and Inline Strainer

Reduced Cost and Improved Performance by Passive Screening

A chemical plant replaced their existing intake structure –offshore intakes with 1/2" diameter screen openings -- with Cook Legacy type screens. The old intake structures had required significant maintenance and created periodic outages. In addition, there was considerable debris in the intake water that had to be removed with an in line strainer system.
The in line strainer systems were expensive to operate and created significant maintenance burdens. The new intake systems included Cook Legacy type screens with openings that excluded the debris that was otherwise gathered and processed through the in line strainer system. The retrofit screens have eliminated the periodic outages and the need for screen maintenance. In addition, the use of the screens has made it possible to take the in line strainer out of the flow loop saving the cost of operating and maintaining the equipment. Costs associated with the collection, processing, transportation, and disposal of debris has been eliminated. Water quality delivered to the process stream has improved. Engineers for the facility calculated payback for the retrofit to be less than 24 months.