

Oak Creek Power Plant Makes Sustainable Expansion with Johnson Screens Passive Intakes

When South Oak Creek needed a solution to boost efficiency while preserving local wildlife, Johnson Screens Passive Intakes delivered

Background

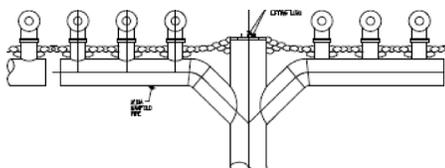
Oak Creek Power Plant, also known as South Oak Creek, is a base load coal/natural gas-fired electrical power station located on Lake Michigan in Oak Creek, WI.

In 2005, two 615-megawatt coal-fueled units were constructed just north of the existing Oak Creek facility. To make this expansion commercially feasible and to maintain compliance with local wildlife preservation standards, South Oak Creek had to rethink their existing cooling system and water intake infrastructure.



Project Details

- **Total Flowrate:** 2,200 MGD
- **Screen Size:** T96 High Capacity
- **Quantity:** 24
- **Screen Material:** Z-Alloy
- **Slot Size:** 0.375 Inches
- **Design Depth:** 43 Feet



Challenge

South Oak Creek had several considerations in mind when designing the new cooling system following the expansion to their plant.

Ideally, the solution they chose would be cost effective to build and operate, offer protection to aquatic life through and offshore location and effective slot size, improve navigation clearance, defend against debris and icing fouling, resist zebra mussels, and minimize system head losses

Solution

To complete South Oak Creek's planned overhaul of their cooling system, 24 T-96HCE Passive Intake Screens in Z-Alloy finish were fabricated for the job. The intakes were 8' diameter and 35' long with 3/8" slot size and a 0.5 ft/sec maximum through-screen intake velocity.

Located 30' offshore in 43' depth, the combined power plant open cycle of the improved cooling system offered an outstanding flow rate of 98.4 m³/sec, equating to 1.56 GPM or 2.2 BGD.

Results

Having met their desired flow rate, South Oak Creek was also able to "assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife..." according to the Wisconsin DNR.

With the new installation, South Oak Creek was able to establish a thermally efficient process while lowering their air emission rates (including CO₂), reducing their capital and O&M costs, and preserve the coastline of Lake Michigan by avoiding the visual impact of a cooling tower.



An Innovation Nearly 60 Years in the Making

Many years after inventing Vee-Wire®, we at Johnson Screens leveraged this technology to introduce a new innovation in 1968: our passive intake screen. 50+ years and over 4,000 installations later, we continue to lead the way in static intake screening equipment.

The combination of our non-plugging Vee-Wire design and our patented internal flow modifiers provide a high open area while maintaining the lowest entrance velocity and pressure drop on the market. Additionally, our passive intakes have no submerged moving parts that could break down or wear out and incorporate the use of the Hydroburst™ air backwash cleaning system, guaranteeing minimal maintenance.

Available in stainless steel, super duplex, and NSF-certified Z-Alloy, every system is fully compliant with Section 316(b) of the Clean Water Act, reducing impingement while protecting aquatic life.



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