CASE STUDY:
OPTIMIZING DERRICK BARGE PERFORMANCE WITH ELECTRIFICATION

OVERVIEW
Collaboration Advances Maritime Efforts to Reduce Fuel Consumption and Related Greenhouse Gas Emissions

CUSTOMER
Kiewit

LOCATION
Seattle

CAT® DEALER
N C Power Systems

PRODUCT
Cat® C18, PGS 1260, Microgrid Master Controller

INDUSTRY
Marine Construction

Hybrid Power Solution Improves Fuel Savings and Operational Efficiency

Derrick Barge Electrification

As an established North American engineering and construction leader, Kiewit depends on carefully engineered technology that performs consistently and reliably across diverse operating environments and geographies. Over Kiewit's 140-year history, Caterpillar has served as the company's primary provider of earthmoving equipment as well as marine power systems for its fleet of derrick barges.

Kiewit's Pacific Northwest fleet comprises more than 20 vessels, some of which date to the 1940s and have been repowered multiple times. Its marine construction work for deep and shallow draft navigation plays a crucial role in preserving vital waterways, bolstering infrastructure and safeguarding coastlines to protect the marine environment.

Committed to reducing greenhouse gas (GHG) emissions while optimizing costs, Kiewit collaborated with Caterpillar Marine to upgrade its existing fleet with an electrification solution.

Modernization That Aligns Performance and Climate-Related Goals

To develop the system, operational data was collected to assess vessel needs and usage patterns to implement an electrification solution onboard the West Coast 180-ton DB Bob Wilson.

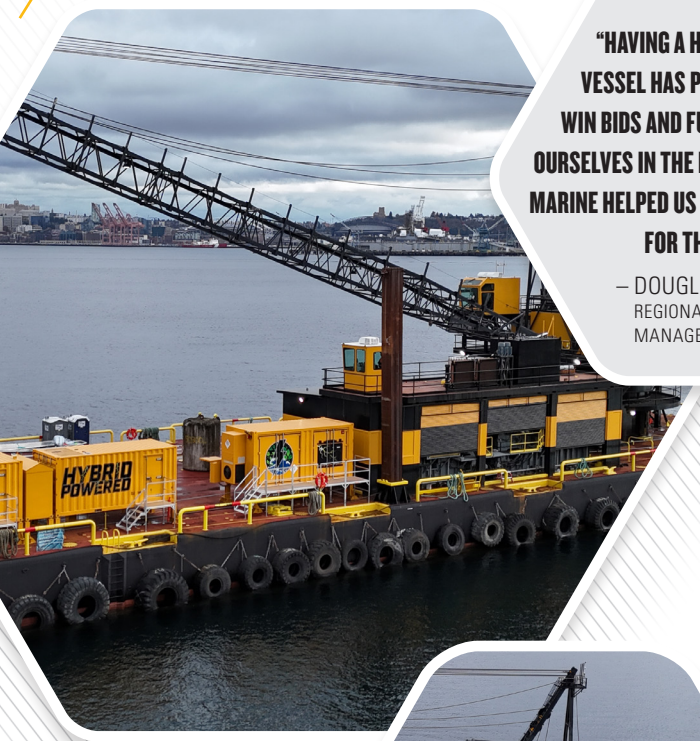
A PGS1260 microgrid system, which integrates energy storage, inverters and a microgrid controller in one package with two EPA Tier 4 Generators. These generators were selected to reduce the cost and complexity of the conversion. The hybrid solution included a 672-kWh battery to support the barge's power demands.

"We required a modern, efficient solution capable of meeting the peak power demands of our derrick barges while minimizing generator idle time," commented Daenan Fairburn, equipment technology director at Kiewit. "This system delivers on both fronts, enhancing performance and sustainability."

HYBRID-POWERED EFFICIENCY

The hybrid solution not only allowed Kiewit the ability to modernize its fleet but also enhance site safety for its vessel operators. Kiewit estimates DB Bob Wilson's hybrid power system will drive significant fuel savings as well as help lower maintenance costs and parts consumption. As a result, four additional derrick barges are being converted to hybrid power and all-electric hydraulic systems.

This initiative enables Kiewit to decrease operating costs through reduced fuel consumption and increased equipment reliability and parts commonality while supporting its climate-related targets. These advantages also enhance Kiewit's competitiveness, as the company is notably one of the first to offer a hybrid-powered derrick barge to the industries it serves.



"HAVING A HYBRID-POWERED VESSEL HAS PROVEN TO HELP US WIN BIDS AND FURTHER DISTINGUISH OURSELVES IN THE INDUSTRY. CATERPILLAR MARINE HELPED US POSITION OUR BUSINESS FOR THE FUTURE."

– DOUGLAS SLOANE,
REGIONAL EQUIPMENT
MANAGER AT KIEWIT

"Having a hybrid-powered vessel supports our ability to meet client needs and adapt to evolving project requirements," said Douglas Sloane, regional equipment manager at Kiewit. "It's one way we're preparing our fleet for future demands."

Remote monitoring capabilities help ensure continued performance and system support to keep Kiewit's fleet fully powered and operational.

As GHG reduction becomes a priority across ports, construction and transportation, Kiewit's hybrid-powered fleet demonstrates how evolving regulations can be met without compromising the performance standards the maritime industry depends on.

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