Powering New York With Offshore Wind Energy

Challenge

On this project, offshore turbines will turn renewable wind energy into electricity to power hundreds of thousands of homes on the mainland in New York State. They will generate three-phase alternating current (AC) that is converted into high-voltage direct current (HVDC) for efficient transportation. In the process, the converters will generate heat that must be removed; highly reliable control of the cooling water is required to keep the system within its specified temperature range as well as to provide fire protection. The equipment also must withstand the harsh marine environment, operate unattended for extended periods, and require little or no maintenance.

Solution

Flowserve is supplying Limitorque® MX multi-turn and QX quarter-turn actuators to be used on about 300 third-party control valves in the fire protection system, for freshwater and drain tank control, and for cooling the HVDC converter. The design of the smart actuators protects critical components in extreme environments. High-quality materials extend actuator service life, operating ranges and mean time between failure (MTBF). In addition, Flowserve is providing 50 Valtek® FlowTop™ control valves and Valtek MaxFlo™ 4 eccentric rotary plug valves, which improve the reliability and uptime of production processes while minimizing operating and maintenance costs. The FlowTop valves are fitted with Limitorque QXM actuators; MaxFlo valves are outfitted with Limitorque MX actuators.

Expert partner for first U.S. application of DC technology

Sunrise Wind will provide 100% renewable energy to help New York accomplish a carbon-free energy grid by 2040. The project is the first application of HVDC to offshore wind energy in the United States.

HVDC technology reduces the number of cables, improves transmission efficiency, and eliminates the need for additional electrical equipment between offshore and onshore converter terminals.

It's exactly the type of energy transition project for which Flowserve is an ideal partner. Our broad portfolio of fluid motion and control solutions and services supports companies around the world in diversifying their energy mix. Working alongside Flowserve enables companies to leverage our global resources and engineering expertise to adopt cleaner sources of energy in the most innovative ways.

Flowserve will supply smart electric actuators and control valves for cooling systems and fire protection in an offshore high-voltage direct current (HVDC) converter platform to be built as part of one of the largest wind power generation farms in New York.

Supplying proven flow control equipment

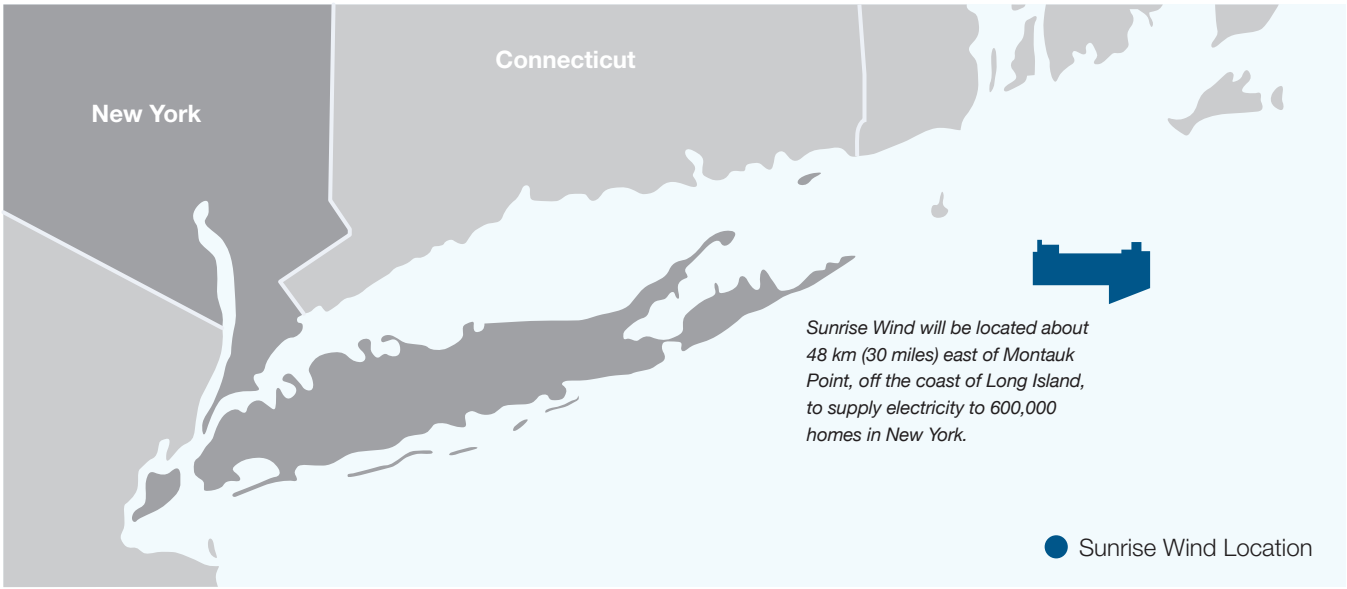
Sunrise Wind — a partnership between energy companies Ørsted and Eversource — with support from Con Edison and the New York Power Authority, plans to construct a 924 MW offshore wind farm to generate electricity for approximately 600,000 homes in New York State. Wind turbines will be erected about 48 km (30 miles) east of Montauk Point, off the coast of Long Island.

Aker Solutions, a Norwegian engineering, procurement, construction and installation (EPCI) company, is designing an offshore high-voltage platform where AC generated by the wind turbines will be converted into DC for distribution to the mainland.

Aker Solutions AS has awarded MRC Global Norway AS contracts to provide the complete scope of valves, instrumentation, piping, tubing and fittings for the Sunrise Wind project.

MRC Global Norway AS has selected Flowserve to supply about 300 Limitorque MX (multi-turn) and QX (quarter-turn) actuators to provide superior and reliable control to third-party valves in a system that cools the DC converter and provides fire protection. In addition, Flowserve will provide 50 Valtek FlowTop linear globe control valves and Valtek MaxFlo 4 eccentric rotary plug control valves — also fitted with Limitorque MX and QXM actuators from Flowserve — to be used throughout the offshore platform for fire protection, freshwater circulation and cooling the HVDC system.

To network and control on-off control valves throughout the HVDC platform, Flowserve will supply four Limitorque Master Station IV units, a Modbus interface that minimizes integration and commissioning. Master Station IV units help maintain asset integrity during normal operations and provide real-time diagnostics.



Meeting unique material standards around the world

Flowserve has been selected because of our successful experience with similar offshore wind turbine farms in the United Kingdom and across Europe.

Importantly, the Flowserve equipment complies with NORSOK M-630, which specifies material and design standards. For example, Valtek FlowTop and MaxFlo 4 control valves are available with bodies and other components made from duplex stainless steel, which withstands corrosive conditions in marine environments.

Limitorque MX multi-turn actuator

Limitorque MX non-intrusive, smart electric multi-turn actuators offer superior reliability, enhanced analytics and an improved user experience. They are designed for application versatility to tackle the toughest, most critical services, including commercial power, water and general industrial processes.

Uncompromised reliability and superior service life are critical requirements in offshore applications. Flowserve provides them with higher-rated components and isolation of input/outputs from outside interference.

Limitorque QX quarter-turn actuator

Limitorque QX non-intrusive electric actuators are designed for a wide range of harsh environment applications such as power and water. The QX actuator's design builds on more than 20 years of proven MX actuator technology to provide all the user-preferred features in a compact, direct-acting, quarter-turn smart actuator package.

They're ideal for offshore applications where getting access to the platforms is expensive. Limitorque QX actuators reduce maintenance and provide long-term reliable performance in extreme offshore conditions. That's made possible by their non-intrusive design, 100% solid-state controls and reliable digital communication control system. Versatility is provided by flexible control configurations, setup and diagnostics in 11 languages, and an advanced brushless DC motor that supports most global voltages, AC or DC.

Valtek FlowTop control valve

Valtek FlowTop control valves meet global requirements for general service and moderately severe service applications such as offshore wind farms by providing:

- Precision control
- A variety of trim and packing options
- Simplified maintenance
- Cost savings through standardized parts interchangeability

Valtek MaxFlo 4 eccentric rotary plug control valve

Flowserve designed the Valtek MaxFlo 4 eccentric rotary plug control valve for applications such as offshore power generation. It controls a wide range of flows and pressure drops but still provides precise control. In addition, the MaxFlo 4 valve flow capacity is higher than a globe valve of the same size; a smaller MaxFlo 4 valve can be specified, reducing weight without sacrificing quality or technical capabilities. Its features include:

- Unobstructed flow path that provides 70% greater flow capacity for a given valve size
- ASME B16.34 compliance to prevent the stem from being removed while the valve is under pressure for increased safety
- Polygon connection between the shaft and plug provides precise control and substantially longer service life

Global resources to meet lead time requirements

MRC Global Norway selected Flowserve because of our proven ability to manage complex projects on time and within budget.

Construction is underway for the offshore HVDC converter platform, which will consist of a steel jacket substructure and a topside platform deck housing the cooling and fire protection systems. Installation of equipment, including the control valves and actuators, is planned to start in 2024; operations are scheduled to begin in late 2025.

For Sunrise Wind, we will manufacture and assemble the actuators and control valves at four facilities, including in the United States. Then Flowserve will provide a single point of contact to ensure the project's 30-week lead time requirement is achieved.

Discover your clean energy future today

Today's energy transition calls for a unique balance of driving carbon reduction while also meeting the world's growing energy demands. To do both requires the development and adoption of cleaner, safer and more reliable sources of energy.

Through projects like Sunrise Wind, Flowserve demonstrates its global leadership in critical energy transition initiatives.

Customers can leverage our 225 years of flow control experience and comprehensive portfolio of product and service solutions to diversify their energy mix, decarbonize their operations, and digitize their plant processes. As your partner, Flowserve also can help you to enhance operational efficiency while supporting your energy transition goals.

Read Flowserve's approach to energy transition.

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AISS000584-00 (EN/A4) January 2023

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