

# World's longest 345 kV AC submarine XLPE cable system Bayonne Energy Center Project, New York Harbor, USA



- World's longest 345 kV AC submarine XLPE cable system
- Three 6.5 mile (10.4 km) single-core submarine cables – each cable extruded in one continuous length without factory joints
- Cables buried at up to 15 feet (4.6 m) in bottom sediments – one of the deepest power cable burials ever

#### Scope of supply

- Cable system design and engineering
- Civil construction work at the landing sites in Bayonne, New Jersey and Brooklyn, New York
- Type testing and fabrication of submarine cables, underground cables and cable accessories
- Freight, cable laying and installation
- Commissioning

#### Cable data

|              |  |
|--------------|--|
| Voltage      | 345 kV AC  |
| Power rating | 602 MVA  |
| Length       | 3×6.5 mile (3×10.4 km) submarine XLPE cables<br>3×900 ft. (3×274 m) underground XLPE cables in Brooklyn<br>3×2,600 ft. (3×792 m) underground XLPE cables in New Jersey |
| Customer     | Bayonne Energy Center  |
| Completion   | 2011   |



### Project description

Bayonne Energy Center is a new high efficiency gas-fired power plant located in Bayonne, New Jersey, that is jointly owned by the independent energy company Hess Corporation and the energy investment firm ArcLight Capital Partners. Built on an old industrial site on the shore of New York Harbor, the plant is strategically located close to the boroughs of Staten Island, Brooklyn and Manhattan. When completed in the spring of 2012, the plant will be able to generate up to 512 MW of electricity for the New York City wholesale power market.

The power generated by the Bayonne Energy Center will be fed into the New York City power transmission network at Con Edison's 345 kV Gowanus substation in Brooklyn. The power will be fed to the substation via the 345 kV AC submarine XLPE cable system, which crosses New York Harbor just south of Ellis Island and the Statue of Liberty.

### Customer requirements and project challenges

Bayonne Energy Center (BEC) required a turnkey cable solution that is safe for the environment and that can reliably deliver the power from the new generating station to the Gowanus substation. The cable solution includes three 345 kV AC single-core underground XLPE cables in Bayonne and Brooklyn installed in traditional duct-banks, and three 345 kV AC single-core submarine XLPE cables installed with approximately 33 ft. (10 m) separation across New York Harbor.

New York is a busy international sea port with freighters, cruise ships, ferries and tourist boats anchoring or operating in the harbor. Due to concerns about future maintenance dredging in the harbor and the risk of anchor damage, state and federal agencies required that the cables be buried at a depth of up to 15 feet (4.6 m) in the bottom sediments.

BEC required that each of the three submarine cables should be extruded in a single continuous length without any factory joints. Such a long extruded cable in one continuous length had never been attempted before at this voltage level. It requires an exceptional level of expertise and quality at the cable factory, with no margin for error in the extrusion process which, for a cable of this length, takes more than 10 days.

### The ABB solution

BEC selected ABB for its ability to meet the technical and quality requirements stipulated.

ABB provided a turnkey 345 kV submarine XLPE cable system including system design and engineering, qualification testing and manufacture, civil construction at the landing sites in Bayonne and Brooklyn, cable laying and installation, and commissioning. All cables were manufactured at ABB's state-of-the-art cable factory in Sweden.

In addition to the submarine XLPE cables, the cable system also includes underground XLPE cable segments, which run for a distance of 2,600 ft. (792 m) on the Bayonne side and 900 ft. (274 m) on the Brooklyn side.

After fabrication and the successful completion of the factory acceptance test, the cables were shipped to New York by freighter, then transferred to a cable laying vessel. Each cable was laid and simultaneously buried at a depth of up to 15 ft. (4.6 m) below the seabed using a jet plow. The work at the landfall sites included construction of in-water cofferdams and horizontal directional drilling (HDD) in Brooklyn. The construction work at the landing sites and the laying of the cables were performed by a local New Jersey based firm (Caldwell Marine International) under a subcontract with ABB.

ABB successfully completed field testing in November 2011 and the cable system was energized in December 2011. The entire BEC project is scheduled to commence commercial operation and supply power to the New York City transmission network in the spring of 2012.

For more information please contact:

#### ABB AB

#### High Voltage Cables

Phone: +46 455 556 00

Fax: +46 455 556 55

E-Mail: [sehvc@se.abb.com](mailto:sehvc@se.abb.com)

[www.abb.com/cables](http://www.abb.com/cables)