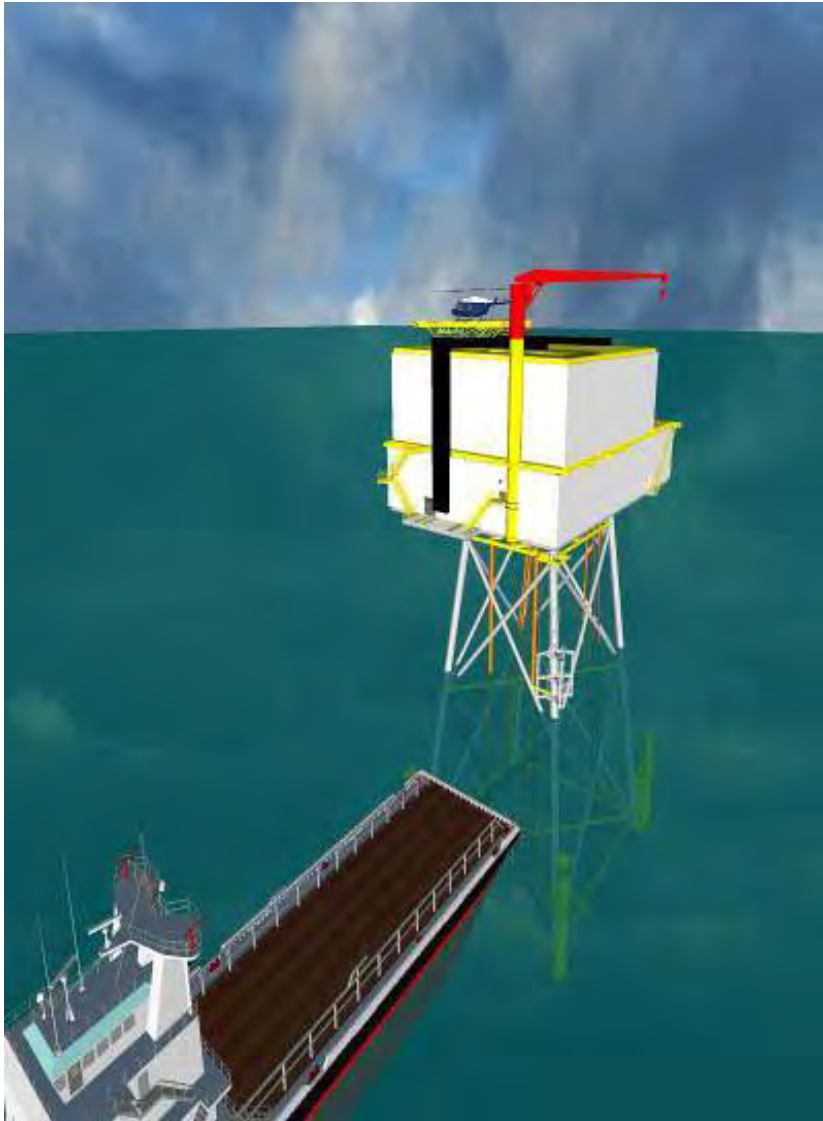


Marc Jeroense, ABB, ICC, March 23, 2010

BorWin1 400 MW HVDC Light® connection for wind power

BorWin1 Project



Customer

- E.ON Netz Offshore GmbH, Germany

Scope

- 400 MW HVDC Light[®] system off-shore station on platform with sub-sea structure
- Onshore station at E.ON substation Diele
- 170 kV GIS switchgear on platform
- Telecommunication system
- Control and protection of complete system

Cables

- Submarine AC cable 170 kV (1x1200 m)
- DC cable submarine to onshore connection (2x125km)
- DC cable on land (2x75km)
- Fibre optic cable (200 km)

BorWin1 Schedule



2007-09-17 Contract award

2008 Jun Start installation of land cable

2008 Aug Start civil construction onshore

2008 Oct Start installation of equipment at offshore fabrication yard

2009 March Start installation onshore

2009-05-23 Module & sub-sea structure ready to sail

2009 Jun Start installation offshore cable

2009-08-07 Offshore platform ready for cable installation

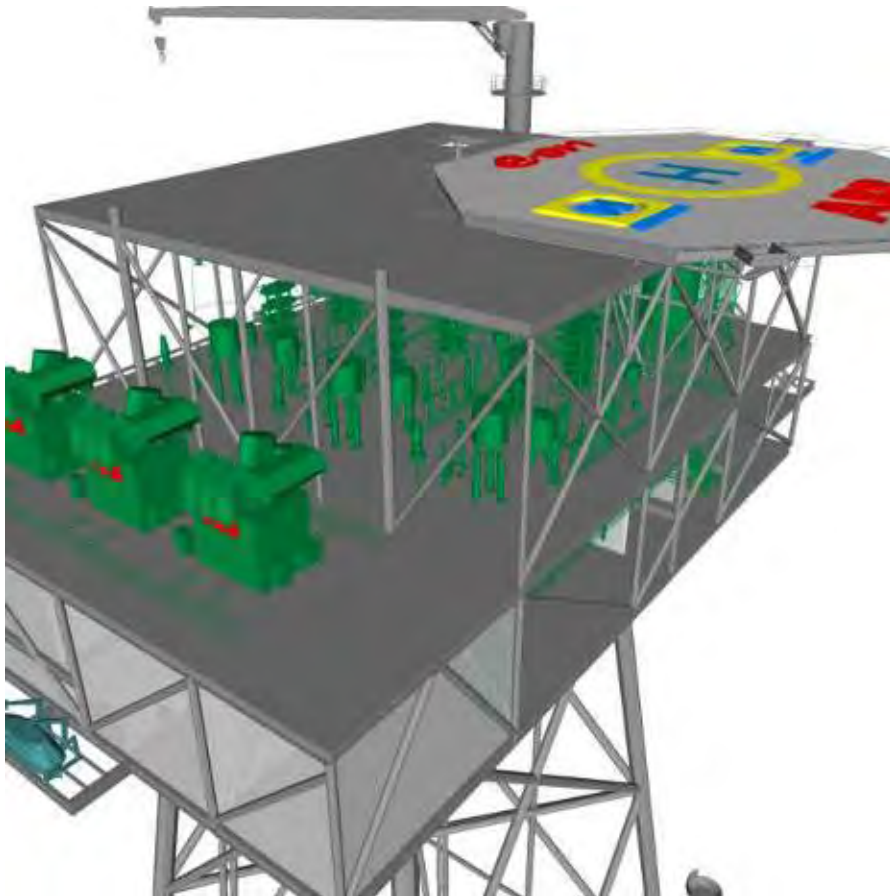
2009-08-15 HVDC system ready to energize

2009-09-01 System ready for transmission testing

2009-09-15 Start trial run

2009-11-24 Acceptance

BorWin1 Platform layout



- Topside weight approx 3200 t (incl. 800 t ABB equipment)
- Size approx 50 x 33,5 x 22 m
- Jacket 1700 t (Height 62 m, sea level to topside approx 20 m)

BorWin1

Fabrication at Heerema, Vlissingen, NL

Lower deck end August 2008



BorWin1

Fabrication at Heerema, Vlissingen, NL

View of jacket top leg sections at EEW Erndtebrucker



BorWin1

Fabrication at Heerema, Vlissingen, NL

Helideck ready for the paintshop April 2009



BorWin1

Fabrication at Heerema, Vlissingen, NL

Jacket structure roll-up April 2009



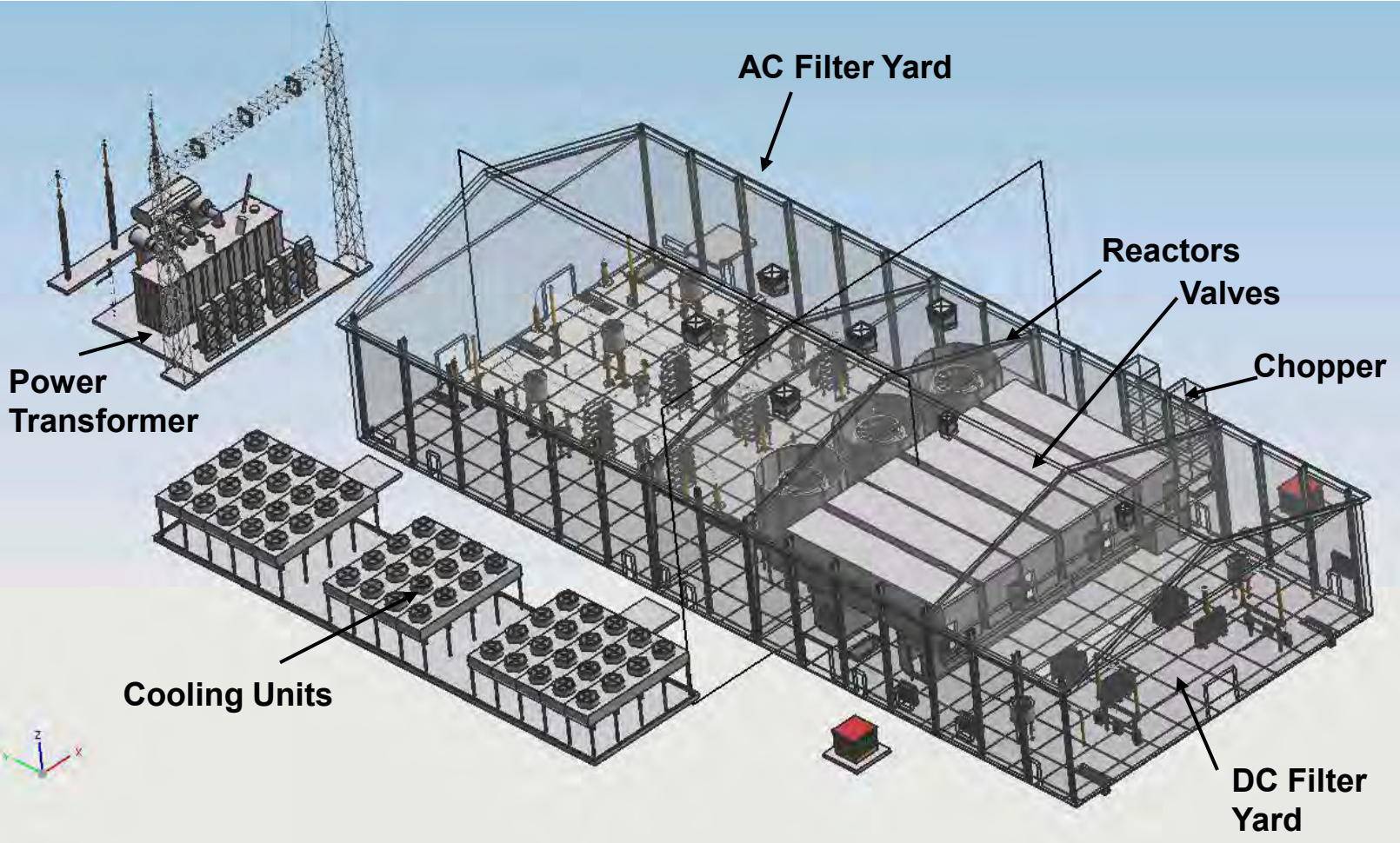
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Fabrication at Heerema, Vlissingen, NL

Topside roll out May 4 2009



BorWin1 Onshore HVDC Light station, Diele



BorWin1

Onshore site at Diele

Converter building slab November 2008



BorWin1

Onshore site at Diele

Erection of converter building steel November 2008



BorWin1

Onshore site at Diele

Converter building & cooling tower catch basin December 2008



BorWin1

Onshore site at Diele

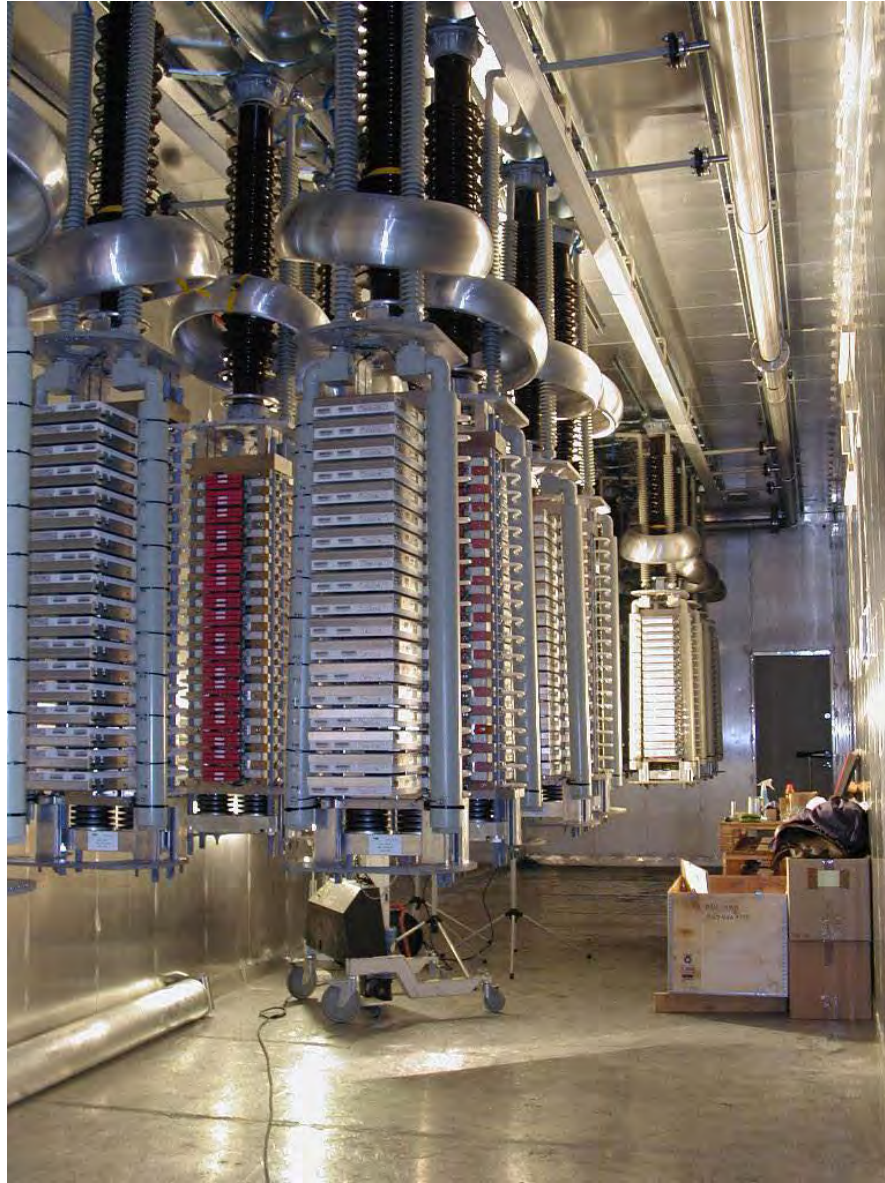
Converter building January 2009



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Onshore site at Diele

Installation of valves April 2009



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HVDC Light cable



- 121 km sea cable (1200 mm² Cu)
- 8.4 km Wadden Sea, Norderney and Ems (1600 mm² Cu)
- 73.6 km land cable (2300 mm² Al)

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Submarine cable

Waiting for installation March 2009



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Cable Installation LK Aurich

Installation of land cable: summer 2008



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Cable Installation LK Aurich

Cable jointing cubicle: summer 2008



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Cable Installation LK Aurich

Cable jointing: summer 2008



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Cable Installation LK Aurich

Directional drilling: summer 2008



Thank you for your attention!