HVDC Light & SVC Light
Reference list

Power and productivity
for a better world™

ABB HVDC Light & SVC Light Projects Worldwide

1	Hällsjön	18	Asia Special Steel
2	Hagfors	19	GHC
3	Gotland	20	Uni Steel
4	Directlink	21	Norfolk
5	Tjæreborg	22	Siam Yamato
6	Eagle Pass	23	BorWin1
7	Trierer Stahlwerk	24	Caprivi Link Interconnector
8	Cross Sound Cable	25	Valhall
9	Murraylink	26	South Steel
10	Outokumpu Stainless	27	Abul Khair
11	Evron	28	Cerro Navia
12	Troll A 1-2	29	East West Interconnector
13	Holly	30	DolWin1
14	Estlink	31	NordBalt
15	Gerdau	32	Skagerrak4
16	ZPSS	33	DolWin2
17	Mesnay	34	Arcelor Mittal
		35	Troll A 3-4
		36	MGI
		37	Mackinac


10
12, 35
1
2
14
32
25
3
31
29
21
23, 30, 33
34
7
11
17
36
20
26
19
27
22
18
16
24
4
9

SCHEME	1. HÄLLSJÖN HVDC Light	2. HAGFORS SVC Light	3. GOTLAND HVDC Light
Commissioning year	1997	1999	1999
Power Transmitted, MW	3	-	50
Direct voltage, kV	±10	-	±80
Converters per station	1	1	1
Direct voltage per converter, kV	±10	-	±80
Direct current, A	150	-	360
Reactive power range, MVAr	±3	0 - 44	+50/-55
Converter station location and AC grid voltage	Hällsjön, 10 kV, 50 Hz Grängesberg, 10 kV, 50 Hz	Hagfors, 36 kV, 50 Hz	Näs, 77 kV, 50 Hz Bäcks, 77 kV, 50 Hz
Length of overhead DC line, km	10	-	-
Cable arrangement	-	-	Bipolar
Length of cable route, km	0.2	-	70
Grounding of the DC circuit	-	-	-
AC grids at both ends	Synchronous	-	Synchronous
Control	Active and reactive power	Steel, reactive power, flicker mitigation	Active and reactive power, AC voltage
Emergency change of power flow	-	-	-
Main reason for choosing VSC system	Pilot system	Flicker mitigation	Wind power, environmental, controllability
Owner	VB Elnät, SWEDEN	Uddeholm Tooling, SWEDEN	GEAB, SWEDEN
Main supplier of converter equipment	ABB	ABB	ABB

4. DIRECTLINK HVDC Light	5. TJÆREBORG HVDC Light	6. EAGLE PASS HVDC Light	7. TRIERER STAHLWERK SVC Light
2000	2000	2000	2000
3 x 60	7.2	36	-
±80	±9	-	-
3	1	2	1
±80	±9	-	-
375	358	-	-
+90/-165	-3/+4	±36	0 - 38
Terranora, 110 kV, 50 Hz Mullumbimby, 132 kV, 50 Hz	Enge, 10.5 kV, 50 hz Tjæreborg, 10.5 kV, 50 Hz	Eagle Pass, 138 kV, 60 Hz	Trier, 20 kV, 50 Hz
-	-	-	-
Bipolar	Bipolar	-	-
65	4.4	0 (Back to Back)	-
-	-	-	-
Asynchronous (when delivered)	Synchronous / asynchronous	Asynchronous	-
Active and reactive power, AC voltage	Active and reactive power, AC voltage, variable frequency control	Active and reactive power, AC voltage	Steel, reactive power, flicker mitigation
-	-	Runback implemented	-
Energy trade, environment, controllability	Wind power, environment, controllability	AC voltage support (SVC operation), power exchange	Flicker mitigation
TransEnergy, USA North Power, AUSTRALIA	Eltra, DENMARK	AEP, USA	Amprion, GERMANY
ABB	ABB	ABB	ABB

SCHEME	8. CROSS SOUND CABLE HVDC Light	9. MURRAYLINK HVDC Light	10. OUTOKUMPU STAINLESS SVC Light
Commissioning year	2002	2002	2002
Power Transmitted, MW	330	220	-
Direct voltage, kV	±150	±150	-
Converters per station	1	1	1
Direct voltage per converter, kV	±150	±150	-
Direct current, A	1200	739	-
Reactive power range, MVAr	±150	+140 / -150	0 - 164
Converter station location and AC grid voltage	New Haven, 345 kV, 60 Hz Shoreham, 138 kV, 60 Hz	Berri, 132 kV Red Cliffs, 220 kV	Tornio, 33 kV, 50 Hz
Length of overhead DC line, km	-	-	-
Cable arrangement	Bipolar	Bipolar	-
Length of cable route, km	40	180	-
Grounding of the DC circuit	-	-	-
AC grids at both ends	Synchronous	Synchronous	-
Control	Active and reactive power, AC voltage	Active power and AC voltage	Steel, reactive power, flicker mitigation
Emergency change of power flow	Runback implemented	Runback implemented	-
Main reason for choosing VSC system	Energy trade, controllability	Energy trade, environment, controllability	Very high flicker mitigation, compactness
Owner	TransEnergie US, USA	TransEnergie US, USA	Outokumpu Stainless Oy, FINLAND
Main supplier of converter equipment	ABB	ABB	ABB

11. EVRON SVC Light	**12. TROLL A 1-2** HVDC Light	**13. HOLLY** SVC Light	**14. ESTLINK** HVDC Light	**15. GERDAU** SVC Light
2003	2005	2004	2006	2006
-	2 x 41	-	350	-
-	±60	-	±150	-
1	2	1	1	1
-	-	-	±150	-
-	400	-	1230	-
±17	Troll A: NA Kollsnes: +24 / -20	+110 / -80	±125	0-64
Evron, 90 kV, 50 Hz	Troll A, 56 kV Kollsnes, 132 kV	Austin, 138 kV, 60 Hz	Espoo, 400 kV, 50 Hz Harku, 330 kV, 50 Hz	Charlotte, 13.2 kV, 60 Hz
-	-	-	-	-
-	Bipolar	-	Bipolar	-
-	67	-	105	-
-	-	-	-	-
-	-	-	Asynchronous	-
Railway, load balancing, active filtering	Motordrive and VHV motor, AC voltage, frequency control	Reactive power	Active and reactive power, AC voltage, frequency control, damping control	Steel, reactive power, flicker mitigation
-	-	-	Runback implemented, black start	-
Active filtering	Platform electrification, environment, CO_2-tax	Voltage support, compactness	Energy trade, AC voltage contol	Flicker mitigation
SNCF/RTE, FRANCE	Statoil, NORWAY	Austin Energy, USA	Nordic Energy Link AS, ESTONIA	Gerdau, USA
ABB	ABB	ABB	ABB	ABB

SCHEME	16. ZPSS SVC Light	17. MESNAY SVC Light	18. ASIA SPECIAL STEEL SVC Light
Commissioning year	2006	2008	2008
Power Transmitted, MW	-	-	-
Direct voltage, kV	-	-	-
Converters per station	1	1	1
Direct voltage per converter, kV	-	-	-
Direct current, A	-	-	-
Reactive power range, MVAr	±82	±15	0-64
Converter station location and AC grid voltage	Ziangjiagang, 35 kV, 50 Hz	Jura Mesnay, 63 kV, 50 Hz	Asia Special Steel, 22 kV, 60 Hz
Length of overhead DC line, km	-	-	10
Cable arrangement	-	-	-
Length of cable route, km	-	-	-
Grounding of the DC circuit	-	-	-
AC grids at both ends	-	-	-
Control	Steel, reactive power, flicker mitigation	Railway, load balancing, active filtering	Steel, reactive power, flicker mitigation
Emergency change of power flow	-	-	-
Main reason for choosing VSC system	Flicker mitigation	Active filtering	Flicker mitigation
Owner	ZPSS, CHINA	SNCF/RTE, FRANCE	Asia Special Steel, JAPAN
Main supplier of converter equipment	ABB	ABB	ABB

19. GHC SVC Light	**20. UNI STEEL** SVC Light	**21. NORFOLK** SVC Light	**22. SIAM YAMATO** SVC Light	**23. BORWIN1** HVDC Light
2009	2009	2009	2009	2009
-	-	0,6	-	400
-	-	-	-	±150
1	1	1	1	1
-	-	-	-	±150
-	-	-	-	1200
0-164	0-164	±0.6	±120	±150
UAE, 33 kV, 50 Hz	Kuwait, 33 kV, 50 Hz	Norfolk, 11 kV, 50 Hz	Bangkok, 22 kV, 50 Hz	Diele, 380 kV BorWin alpha, 170 kV
-	-	-	-	-
-	-	-	-	Bipolar
-	-	-	-	203
-	-	-	-	-
	-	-	-	Asynchronous
Steel, reactive power, flicker mitigation	Steel, reactive power, flicker mitigation	Active and reactive power	Steel, reactive power, flicker mitigation	Active and reactive power, AC voltage, frequency control
-	-	-	-	Runback implemented
Flicker mitigation	Flicker mitigation	Dynamic energy storage, Voltage support	Flicker mitigation	Offshore wind, power to shore
GHC-Emirates Steel Industry UNITED ARAB EMIRATES	UniSteel, KUWAIT	UK Power Networks, UK	Siam Yamato Steel, THAILAND	TenneT Offshore, GERMANY
ABB	ABB	ABB	ABB	ABB

SCHEME	24. CAPRIVI LINK INTERCONNECTOR HVDC Light	25. VALHALL HVDC Light	26. SOUTH STEEL SVC Light
Commissioning year	2009	2010	2011
Power Transmitted, MW	300	78	-
Direct voltage, kV	350	150	-
Converters per station	1	1	1
Direct voltage per converter, kV	350	75	-
Direct current, A	857	573	-
Reactive power range, MVAr	± 200	Valhall: -10/+48, 110 transient Lista: ± 50	0-175
Converter station location and AC grid voltage	Zambezi, 330 kV, 50 Hz Gerus, 400 kV, 50 Hz	Lista, 300 kV Valhall, 11 kV	Saudi Arabia, 33 kV, 50 Hz
Length of overhead DC line, km	950	-	-
Cable arrangement	-	-	-
Length of cable route, km	-	292	-
Grounding of the DC circuit	Earth electrode	-	-
AC grids at both ends	Synchronous	50 Hz, 60 Hz isolated	-
Control	Active power, AC voltage, frequency control	AC voltage, frequency control	Steel, reactive power, flicker mitigation
Emergency change of power flow	Runback implemented, power supply of black network	-	-
Main reason for choosing VSC system	Energy trade, energy import, weak AC networks	Platform electrification, environment, CO2-tax	Flicker mitigation
Owner	NamPower, NAMIBIA	BP, NORWAY	South Steel, SAUDI ARABIA
Main supplier of converter equipment	ABB	ABB	ABB

27. ABUL KHAIR SVC Light	28. CERRO NAVIA SVC Light	29. EAST WEST INTERCONNECTOR HVDC Light	30. DOLWIN1 HVDC Light
2011	2011	2012	2013
-	-	500	800
-	-	200	±320
2	1	1	1
-	-	200	± 320
-	-	1250	1250
0-110	-65/+140	± 150	± 260
Bangladesh, 33 kV, 50 Hz	Cerro Navia, 220 kV	Woodland, 400 kV Shotton, 400 kV	Dörpen, 380 kV DolWin alpha, 155 kV
-	-	-	-
-	-	Bipolar	Bipolar
-	-	250	165
-	-	-	-
-	-	50 Hz, Asynchronous	Asynchronous
Steel, reactive power, flicker mitigation	Reactive power, AC voltage	Active and reactive power, AC voltage, frequency control, damping control	Active and reactive power, AC voltage, frequency control
-	-	Black start	Black start
Flicker mitigation	-	Security of supply, Energy trade, AC voltage control, Black start capability	Long distance offshore wind power grid connection
Abul Khair, BANGLADESH	Transelec, CHILE	Eirgrid, IRELAND	TenneT Offshore, GERMANY
ABB	ABB	ABB	ABB

SCHEME	31. NORDBALT HVDC Light	32. SKAGERRAK 4 HVDC Light	33. DOLWIN2
Commissioning year	2015	2014	2015
Power Transmitted, MW	700	700	900
Direct voltage, kV	±300	500	±320
Converters per station	1	1	1
Direct voltage per converter, kV	±300	-	±320
Direct current, A	1250	-	1 406
Reactive power range, MVAr	±350	-	-300/+380
Converter station location and AC grid voltage	Klaipeda, 330 kV Nybro, 400 kV	Kristiansand, 400 kV Tjele, 400 kV	Dörpen, 380 kV DolWin beta, 155 kV
Length of overhead DC line, km	-	-	-
Cable arrangement	Bipolar	Bipolar	Bipolar
Length of cable route, km	450	240	135
Grounding of the DC circuit	-	-	-
AC grids at both ends	Asynchronous	Asynchronous	Asynchronous
Control	Active and reactive power, AC voltage, frequency control, damping control	Active and reactive power, AC voltage, frequency control, damping control	Active and reactive power, AC voltage, frequency control
Emergency change of power flow	Black start	Black start	Black start
Main reason for choosing VSC system	Prepare for future DC grid, black start capability	Grid stability, black start capability	Long distance offshore wind power grid connection
Owner	Svenska Kraftnät, SWEDEN LITGRID turtas AB, LITHUANIA	Statnett, NORWAY Energinet.dk, DENMARK	TenneT Offshore, GERMANY
Main supplier of converter equipment	ABB	ABB	ABB

34. ARCELOR MITTAL SVC Light	**35. TROLL 3&4** HVDC Light	**36. MGI** SVC Light	**37. MACKINAC** HVDC Light
2013	2015	2013	2014
-	2 X 50	-	200
-	±60	-	±71
1	2	1	1
-	±60	-	±71
-	460	-	1 444
-32/+48	±24	0-164	±100
Bremen, 30 kV	TROLL A, 60 kV Kollsnes, 132 kV	Suleymania, 33 kV	Mackinac, 138 kV
-	-	-	-
-	Bipolar	-	-
-	67	-	-
-	-	-	-
-	-	-	Synchronous
Reactive power, flicker	Motordrive and VHV motor, AC voltage, frequency control	Reactive power, flicker	Active and reactive power. STATCOM mode at outage of one converter. AC Line emulation. Islanded Operation.
-	-	-	Automatic runback. Black start.
Flicker mitigation	Environment, long submarine cable distance, compactness of converter on platform	Flicker mitigation	Power Flow Control. Weak networks.
Arcelor Mittal, GERMANY	Statoil, NORWAY	MGI Steel Factory, IRAQ	American Transmission Company (ATC), USA
ABB	ABB	ABB	ABB

Notes

Contact us

ABB AB
Grid Systems - HVDC
SE-771 80 Ludvika, Sweden
Phone: +46 240 78 20 00
Fax: +46 240 61 11 59

www.abb.com/hvdc

ABB AB
Grid Systems - FACTS
SE-721 64 Västerås, Sweden
Phone: +46 21 32 40 00
Fax: +46 21 32 48 10

www.abb.com/facts

POW-0027 Rev.13, Elanders Sverige AB, May 2012