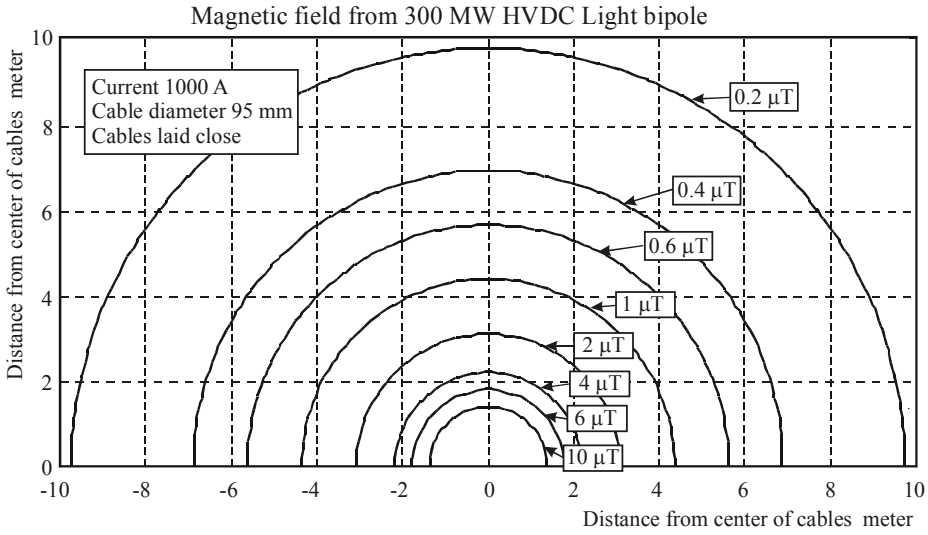
HVDC Light

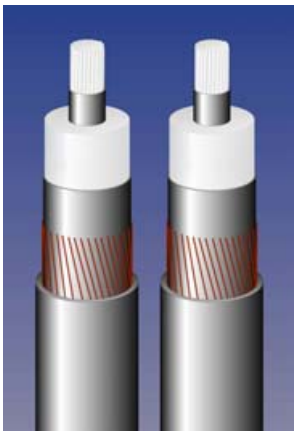
Directlink Project Queensland – New South Wales in Australia

Cable data	
Voltage	+/- 84 kV DC
Power	180 MVA
Length	6 x 65 km = 390 km
Conductor	630 mm^2 Al
Insulation	Polymeric
Weight	4.5 kg/m
Customer	TransÈnergie
Year	2000

Project content

HVDC Light Cable and accessories
Cable System design
Project management
Installation





The Directlink project is a HVDC Light transmission system between the States of Queensland and New South Wales in Australia. This is an ITP (Independent Transmission Project) developed by TransÈnergie (a subsidiary of Hydro-Quebec) and North Power. Directlink is rated at 180 MVA and interconnects the Queensland and New South Wales networks via an underground cable transmission route of some 65 km, mainly along existing rights-of-way, along a railway and a number of roads. The driving force behind this project was a capacity shortage in Southern Queensland combined with surplus capacity in New South Wales. HVDC Light was the preferred choice due to the short delivery time, just 12 months and the ease of cable installation. The link has been transmitting power since April 2000.

HVDC Light technology

HVDC Light is a concept of modern technology based on bi-polar converters and extruded DC cables with power units up to 300 MW. HVDC Light converters give very high speed control of active and reactive power in both the AC and DC networks. The HVDC Light Cable is a cable with extruded polymeric insulation and it is specifically adapted for direct voltage. The strength and flexibility of the HVDC Light Cables make them well suited for severe installation conditions both as an underground land cable and as a submarine cable. HVDC Light therefore provides the ideal medium for transmitting power over any distance underground or under the sea. HVDC Light Aerial Cables can be used where necessary.

HVDC Light Cable qualification

The HVDC Light polymeric cable system is now qualified up to 150 kV (Um=165 kV). The qualification tests comprised long Term testing and Type tests, all of which were successful. As of May 2000 538 km of HVDC Light Cable had been commercially delivered for the three projects at Gotland in Sweden, Tjaereborg in Denmark and Directlink in Australia.

New applications with polymeric HVDC Light Cables

Compared with traditional paper insulated cable, polymeric cable has a number of advantages due to its excellent mechanical strength and flexibility. These allow the use of:

- Land cables in steep areas.
- Submarine cables in extreme depths of water.
- Aerial cables where it is not possible to use land cables.

Cables instead of overhead lines

The increasing demand to use underground cables in place of overhead lines has many reasons. These reasons include:

- Storms, falling trees, snow or ice loads do not cause damage to underground cables.
- Underground cables have no impact on areas of natural beauty.
- The land can be used for other purposes.
- No maintenance is required whereas overhead transmission lines require thermographic checks of conductor joints, insulator checks and the constant clearing of growing trees from the power lanes.

Low magnetic fields from HVDC Light Cables

The HVDC Light Cable System has the advantage due to its bi-polar construction of virtually eliminating magnetic radiation associated with other systems.

Cable accessories

HVDC Light Cable accessories have been developed for all applications including;

- Cable terminations inside the HVDC Light Converters.
- Prefabricated stiff joints normally used on land cables.
- Site moulded flexible joints, normally used on submarine cables.

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