

Murraylink HVDC Light Interconnection Victoria - South Australia



ABB



One early experience from the Murraylink operation is the effect of this voltage control at the connection points of the AC networks. Normally the AC networks worked with fairly high voltage variations. The voltage variations have become insignificant from the start of operations on the Murraylink transmission system.



Burying of the land cable.

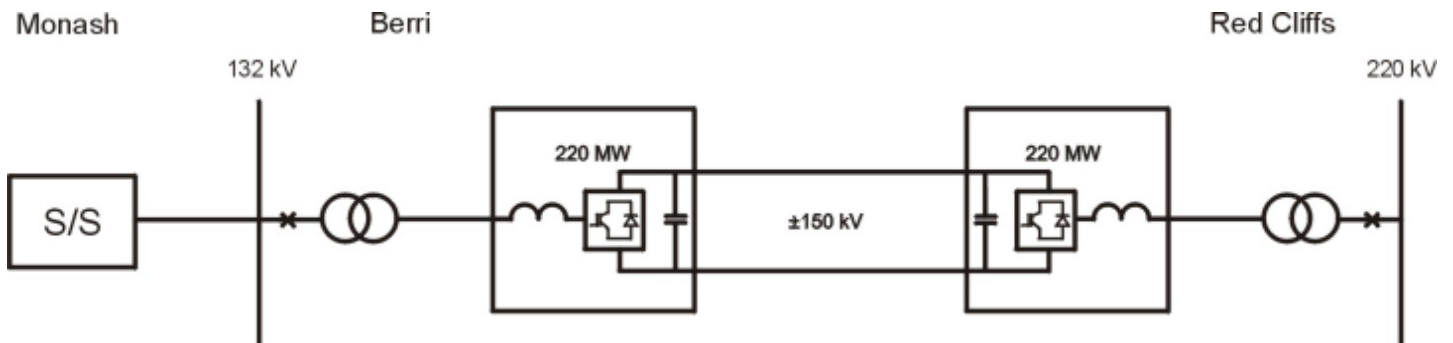
Benefits

The Murraylink transmission system is an underground cable interconnection between the Riverland region of South Australia and the Sunraysia region of Victoria, commissioned in 2002. The interconnection allows power to be traded between the two States on a purely commercial basis. It offers network capacity to the regulating body, and the operation depends on bids accepted by NEMMCO. The link adds up to 220 MW of energy support to meet the electricity needs of around 200,000 households.

Reliability of the electrical networks of the Riverland and Sunraysia regions is also improved, both in terms of power supply and system voltage control. The converter stations have the dual ability both to transmit power and to support the AC voltage of the surrounding networks. This feature is important in particular for the weak network at Berri, at the edge of the South Australian system.

The use of buried cables at existing rights of way and reseeding the cable route after laying have ensured positive community acceptance and easy granting of permits. Underground cables eliminate the risk of lightning failures and consequential bush fires. The converter stations have an aesthetically pleasing design, with most of the equipment installed inside the converter buildings.

Diagram illustrating Murraylink HVDC Light Interconnection.





Converter station at Berri.



Converter station at Red Cliffs.

Description

Murraylink is a 220 MW (or 220 MVA) HVDC Light™ project with the converter stations at Red Cliffs in Victoria and Berri in South Australia connected by a pair of 176 km underground DC cables. The Monash substation adjacent to Berri converter station is also within the project.

Main data

Rated power	220 MW
DC voltage	± 150 kV
DC current	739 A

AC system voltage

Red Cliffs	220 kV
Berri	132 kV

Reactive support at rated power

Inverter operation	-100 – +100 MVAR
Rectifier operation	-75 – +125 MVAR

IGBT valves

Valve type	VSC 3 level
IGBT type	2.5 kV/1000 A
Cooling system	water

HVDC Light cables

Cross section	1200 and 1400 mm ² , Aluminum
Outer diameter	80.2 and 83.7 mm
Length	2×176 km

Murraylink employs the HVDC Light™ technology with voltage source converters with the ability for fast and accurate control of both the active and reactive power flow independently of each other.

The reactive power capability is used to control the AC voltage to a constant level. This is especially important when transferring power through weak AC networks. The active power is variable from zero to full power rating in either direction.

Control system

The control system of Murraylink is a modern digital microprocessor-based system (MACH 2). It is user friendly and includes control features such as:

- Active and reactive power control
- DC and AC voltage control
- Power quality control
- Runback

The runback function reduces the active power in the event of contingencies in the AC network, when an important AC line in the receiving or the supplying AC network is tripped.

The Cable

The HVDC Light cable is made with extruded polymer insulation and specifically adapted for direct voltage. The strength and flexibility of HVDC Light cables makes them well suited for severe installation conditions both as underground cable and as submarine cable.

Underground cables were chosen instead of overhead transmission lines for Murraylink to ensure minimal visual and environmental impact – and a rapid means of getting the project onto the market. The cables were drilled under the Murray River, all road and rail crossings and a number of significant Aboriginal heritage sites.

Murraylink proves that long distance undergrounding with HVDC Light is technically and economically feasible.



Murraylink HVDC Light cable, triple extruded polymer insulated system.



Environment

The Murraylink project – the world's longest underground high-voltage interconnection at 176 kilometers – won the 2002 Case EARTH Award for Environmental Excellence for best practice and innovation in the environmental management of civil construction projects. The award was presented by the Civil Contractors' Federation of Australia.

In 2003 The Murraylink Interconnector was recognized with the Engineering South Australia Award, by The Institute of Engineers, Australia. Murraylink also received awards in the categories: Project Infrastructure and Environment.



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