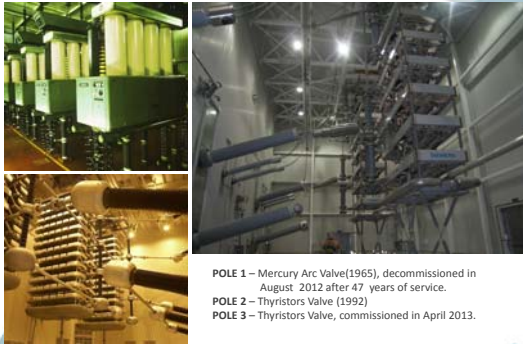


Background



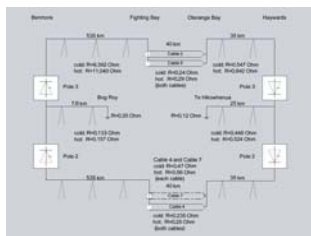
POLE 1 – Mercury Arc Valve(1965), decommissioned in August 2012 after 47 years of service.
POLE 2 – Thyristors Valve (1992)
POLE 3 – Thyristors Valve, commissioned in April 2013.



Fast Facts



Facts/Timeline



- Total estimated cost \$672 million.
- Capacity increased to 1000MW in 2013.
- Capacity increased to 1200MW in 2014.
- Total length of HVDC transmission line 570km.
- Length of HVDC submarine cable 40km.



HVDC Basics



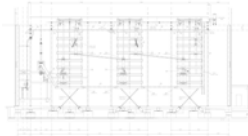
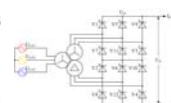
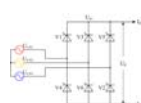
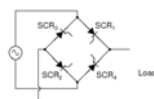
Key Components

- 1 AC Switchyard
- 2 AC Filter Banks
- 3 Converter Transformers
- 4 Thyristor Valves
- 5 Smoothing Reactor & DC Filter
- 6 DC Switchyard



Theory

- 1 ϕ AC to DC (4 pulse)
- 3 ϕ AC to DC (6 pulse)
- 3 ϕ AC to DC (12 pulse)



Converter Transformer

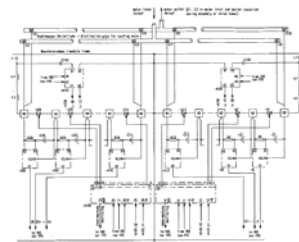


- YNyn0d1
- 271/135.5/135.5 MVA
- 220kV to 143.7/√3 kV and 143.7kV



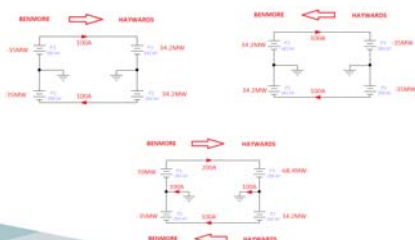
Thyristor Module

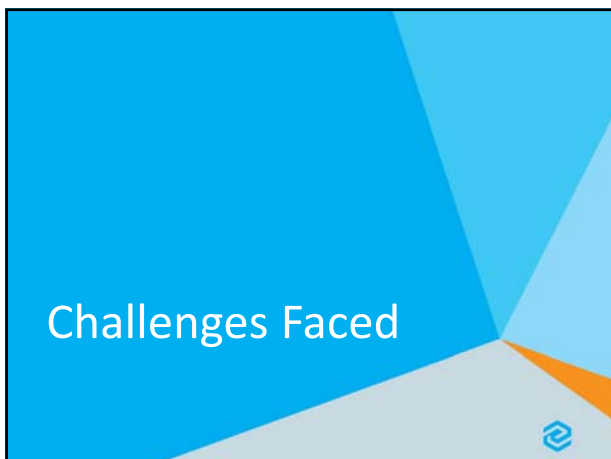
- Light Triggered Thyristors
- Voltage Monitoring Unit
- Recovery Protection Unit
- Valve Base Electronics
- Thyristor Control & Monitoring



Power Transfer

- South to North
- North to South
- Round Power









Energy Market

- HVDC: Commercial Tool
- Reserves in place for Contingency Events





Questions?

Electrix Statement of Purpose

Pride
Performance
Value