

# Moyle Interconnector



LTT quadruple valves assembled on site

Innovative HVDC technology is implemented in the new HVDC connection, the **Moyle Interconnector**, a dual monopole (2x250 MW) system connecting the transmission systems in Northern Ireland and Scotland via a 55 long cable (with 3+5 km on land).

The Interconnector features state-of-the-art direct light triggered thyristors and a modular redundant control system in addition to the use of cables with integrated return conductors as well as innovative triple tuned AC harmonic filters and hybrid optical DC current measuring devices.

The main design objective of the Moyle Interconnector is to establish an electricity interconnection with low losses and a very high availability and reliability combined with a low maintenance. The high performance of the converter stations is reflected in the guaranteed losses of less than 1.35 % and a guaranteed value for the energy availability of more than 99.6 %.

The Moyle Interconnector consists of two monopolar submarine HVDC cable operating in parallel on the AC systems. The cable system is of the Integrated Return Conductor type (IRC), where the return cable is integrated into the HVDC cable, i.e. a metallic coaxial layer integrated in the cable forms the return path for the current. Applying the return conductor concentrically around the main conductor, outside the lead sheath, satisfies several major goals: the core is a conventional mass-impregnated cable core, the return conductor insulation may be of different material than the main insulation, there is no external magnetic field, the laying properties are as for a conventional cable and the return conductor is also part of the armouring.

The control and protection systems in each converter station following the modern concept of a completely modular and redundant design with several benefits: modular design which provides optimum redundant solutions, design structured for easy future expansion,

application of well proven standard hardware and software systems, high integration of all control and protection systems, satellite synchronised station master clock system, modern redundant fibre optical field bus systems and local area networks, standardised telecommunication systems and protocols for inter station communication and for communication to control centres for remote control, and I/O Units with redundant field bus interface.

Both main contractors, Siemens and Nexans, have followed the overall time schedule of 26 months with commissioning set for late 2001 – despite unforeseen obstacles such as the foot and mouth disease causing major delays.

## Tech-wise Services

For this project Tech-wise has been involved from the very start taking an active part in the development of the Enquiry Specifications, Public Enquiry, Tender Negotiations and Contracting, QA procedures, Testing Procedures, Commissioning.

## Technical Data

Cable Capacity	Integrated Return Conductor from Nexans 2 x 250 MW, 1000 A continuously No overload capability
Length	55 km submarine, 5+3 km land
Outer ? & weight	115 mm - 400 N/m
Losses	36 kW/km at full load (1000 A)
Converters	from Siemens
AC connection	275 kV in both stations
DC-side	250 MW/pole, 250 kVdc, 1000 A
Transformers	12 single phase 3 windings + 1 common spare
HVDC valves	Light-triggered thyristors 39 thyristors/valve, 2 redundant
AC-filtre	All rated 59 Mvar, triple- and single-tuned
DC reactor	200 mH 1000 A