

## Moyle Interconnector - Forming a Bridge between Great Britain and Ireland

### Fault recording for HVDC transmission systems

#### ■ The company

Two power supply companies have joined forces to build a bridge between Northern Ireland and Scotland by means of the Moyle DC Interconnector. In order to meet rising energy demands, Northern Ireland Electricity (NIE) had to expand its 275 kV three-phase system in Northern Ireland. Scottish Power, Scotland's national power supply company, provided the connection to the Scottish three-phase system.

#### ■ The starting situation

The exchange with Scotland proved to be the most economical, safe and ecological solution for obtaining the necessary power. The Moyle transmission project will enhance the security of supply to the Emerald Isle while also improving NIE's competitive position.

This HVDC interconnection, known as the Moyle Interconnector, is a dual-monopole system. Each of the 250 MW poles is designed for bi-directional power transfer. Two submarine cables through the channel will bridge the 64 km gap between Scotland and Ireland.

Each converter station has a rated power of 250 MW at 250 kV DC. The HVDC thyristor valves are equipped with direct-light-triggered thyristors with integrated overvoltage protection.

#### ■ The concept

For this project, Siemens Power Transmission and Distribution supplied electronic equipment including a number of SIMEAS R fault recorders for the two converter stations located at Auchencrosh in Ayrshire (Scotland) and Ballycronan More in County Antrim (Northern Ireland).



Fig. 1 HVDC power station in Ireland

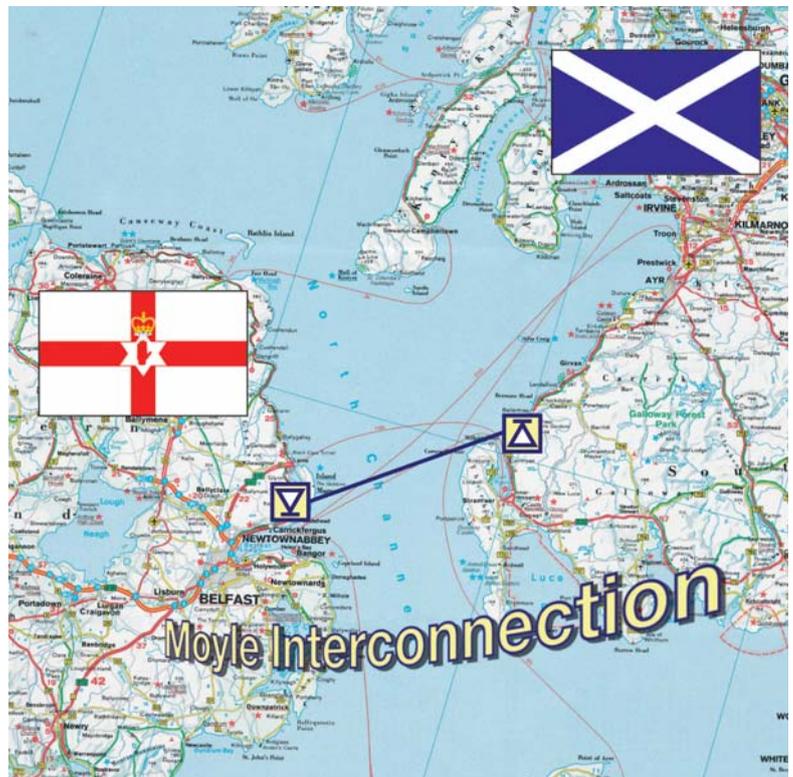


Fig. 2 "Moyle Interconnection" between Scotland and Northern Ireland

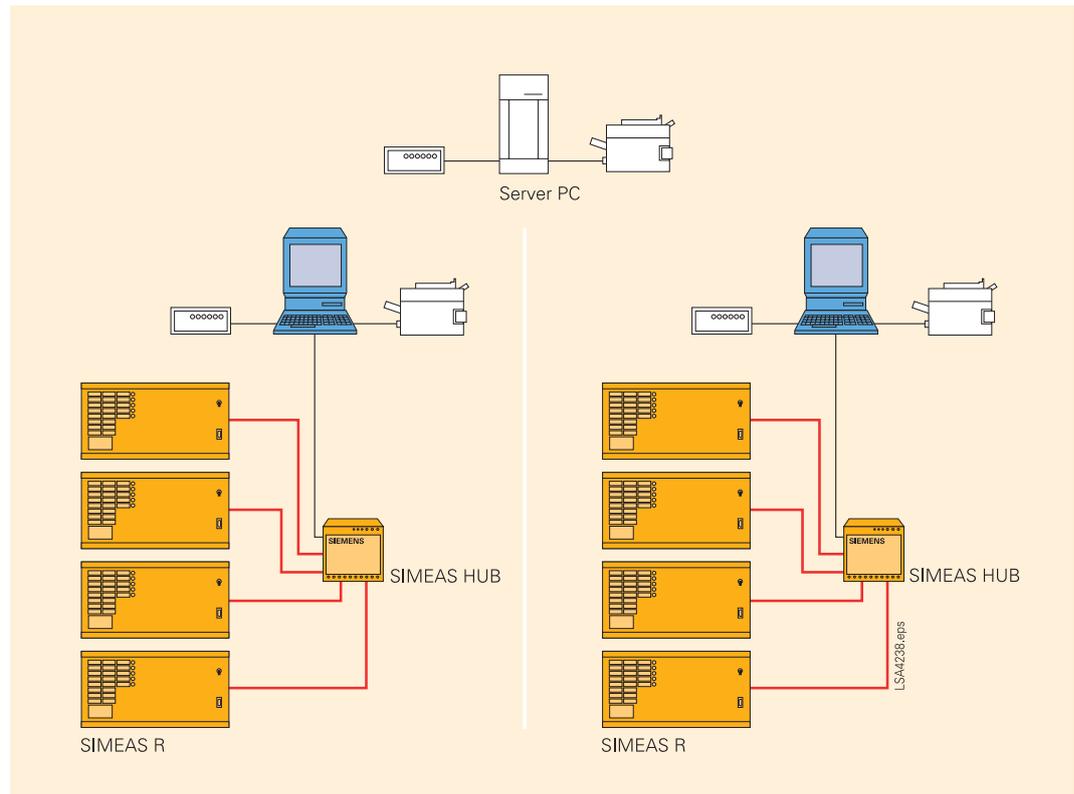


Fig. 3 Configuration of the fault recording systems

#### ■ The special advantages

##### *Fast on-site analysis*

Each station contains several SIMEAS R ZE32/64 recorders with various recording modules (DAUs). The SIMEAS R recorders are connected to the local evaluation station via an Ethernet interface. Each local evaluation station comprises a PC, local printer and modem, providing for fast on-site analysis. It is also possible to simultaneously transmit the data to a higher-level evaluation station automatically via the telephone line. In the event of a fault, the SIMEAS R recorders are started by a network trigger and serve to record all analog and binary signals.

##### *Data evaluation and archiving*

The evaluation station and server PC are available for evaluating, analyzing and archiving the fault records. The OSCOP P system program is installed on the individual PCs and provides automatic remote data transmission, archiving and diagnostic output of measured-value files. The OSCOP P software is also used for parameterizing SIMEAS R and has extensive calculation, filter and statistics functions.

Data from the individual SIMEAS R fault recorders is retrieved and stored on the individual PCs. These PCs operate with OSCOP P in automatic mode, meaning they automatically retrieve the fault records from the individual SIMEAS R recorders and automatically store them in the OSCOP P data base.

##### *One device-many functions*

When a fault occurs, SIMEAS R records and documents all DC and AC values, as well as individual binary values such as trips, HV breaker positions and critical alarms. It also records and documents tests. But this isn't all SIMEAS R can do: It provides commissioning tools for optimally configuring protection and control, plus it generates fault logs for tracing the causes of plant failures and, if appropriate, implements preventive measures.

■ From practical experience  
SIMEAS R Records

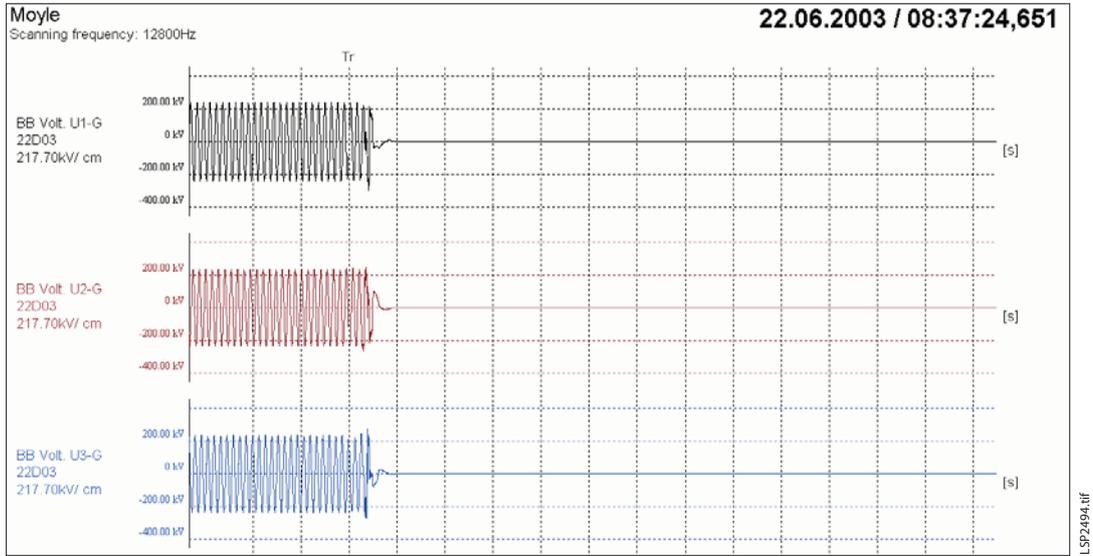


Fig. 4 Example of SIMEAS R record

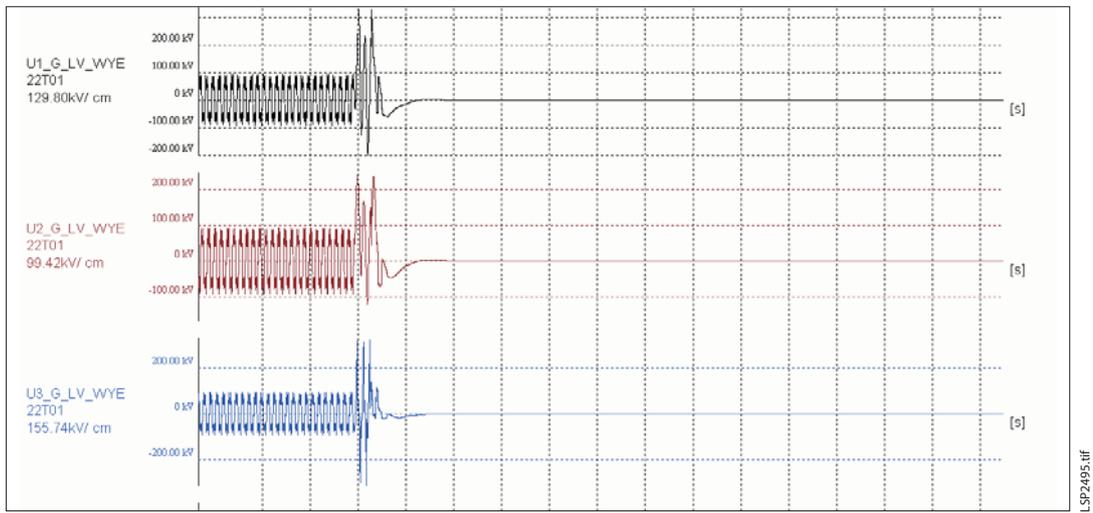


Fig. 5 Example of SIMEAS R record

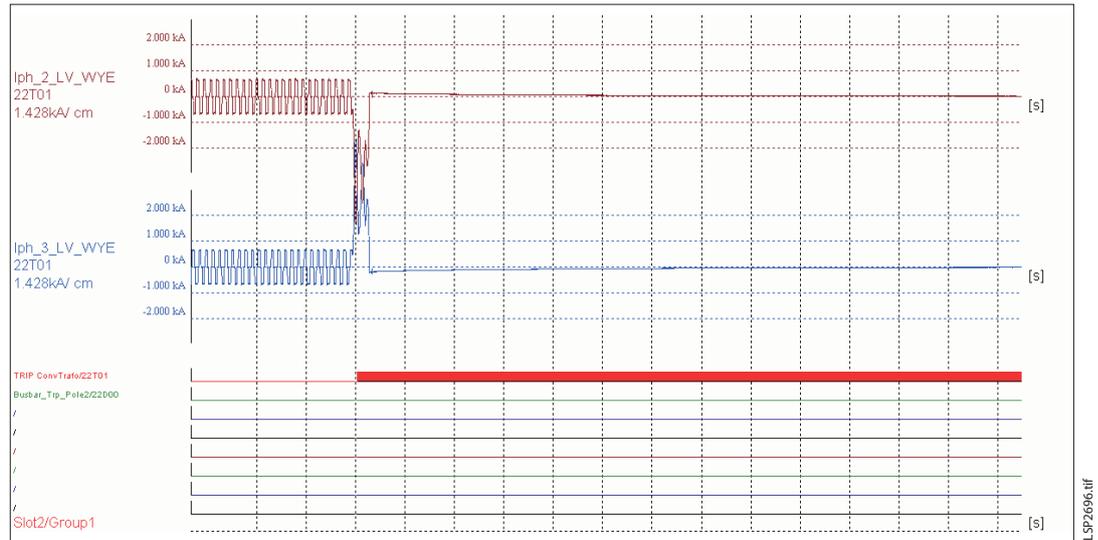


Fig. 6 Example of SIMEAS R record

#### ■ Conclusion

The Moyle Interconnector links the power supply systems of Scotland and Northern Ireland using an HVDC interconnection, thereby improving the stability of the power supply in Northern Ireland. SIMEAS R digital fault recorders are also used. Their numerous functions permit a fast and reliable identification of weak points using only one device.