A.3.2
Experience with 2nd generation gas-insulated transmission lines GIL
KOCH H., Siemens AG, Germany

Abstract: The Gas-Insulated Transmission Lines (GIL) of the second generation are now in services since more than 2 years, with very good service experiences. The 2nd generation GIL is insulated with N2/SF6 gas mixtures and the design and laying technique is primary dedicated to long distance transmission lines.

The paper gives examples of the key experiences for long distances applications and shows future possibilities where GIL is the best technical solution. New applications of GIL as a high power transmission line used together with public accessible tunnels like train or street tunnels will be explained. Also the application of special energy tunnels over long distances will be explained.

Keywords: Gas-Insulated Transmission Line (GIL) - Tunnel Laid - PALEXPO - Sai Noi - Design and Layout of GIL - High Power Transmission - Long Length

1. Introduction

With the commissioning of the 500 m long gas-insulated transmission line (GIL) at the Geneva Airport, Siemens is the first manufacturer of the second generation GIL world-wide. This project concluded successfully the recent development works on this future transmission technology. The redesign of GIL brought a reduction of costs by more than 50%. The main changes were replacing pure SF6 by a gas mixture of N2 and SF6 as insulating medium and by adopting pipeline laying methods into the laying process.

Based on the now more than 30 years of experience in gas-insulated high voltage technology the redesign of the first generation GIL installed in 1974 at the Hydro Power Plant Wehr in Germany was started in 1995 with a first feasibility study together with EDF [1].

In the following for both types (directly buried and tunnel-laid) a prototype set-up was built at IPH, an independent test lab in Berlin. The development and test program have been carried out in co-operation with three major German utilities. The main intentions of the tests were to simulate the electrical and mechanical stresses of a lifetime of more than 50 years.