



Study Committee B3 “Substations”

Working Group

Working Group No. B3.18

Convenor: Peter Glaubitz,

Title of the working group: SF₆ Tightness Guide

Scope of the work

State-of-the-art electric power equipment is designed and manufactured to maintain integrity and tightness for decades so that it is compatible with the environment for the whole service life. This implies:

- Very low leakage rates: the quality of the encapsulation including its material, the machining process, the design of gaskets, the sealing material itself, the quality of secondary connections (e.g. piping, valves, sensors, bursting disk) and the factory testing procedures are of major importance;
- Very low handling losses: smaller gas compartments, reduced frequency of maintenance activity (e.g. opening a gas compartment for inspection, checking the gas quality, checking the gas density/pressure with an external density/pressure gauge), more sophisticated tools and instruments to handle and to check the gas quality, specific training of designated personnel. Refer to CIGRE Brochure N. 276 - Guide for the Preparation of “Customised SF₆ Handling Instructions” for further information.

The prepared document should review all significant aspects of measuring and how to guarantee the tightness of electric power equipment containing SF₆ as a pure gas or combined with other gases (i.e.: N₂) to form a gas mixture.

Requirements from the International Standard are critically reviewed. A functional description concerning state-of-the-art test procedures, test methods and instrument devices is then performed. The difference between what can be measured (and how it can be done) and what can be assessed forms the conclusions.

Type-testing, factory routine testing, on-site testing during service are described, continuous on-line monitoring (i.e.: supervision of the SF₆ density using on-line monitoring systems) is included.

Any mechanical withstanding or rupture test (i.e.: water rupture test), performed at pressures above the maximum operating gas pressure, is carried out for safety purpose and therefore are not covered in this document except for the Impact of mechanical pressure test procedures on tightness test results.

Deliverables

1. The work will start with the structure of the document “SF₆ Tightness Guide”.
2. Prepare a guide in which the requirements from Standards will be critically reviewed, the functional description of the testing procedures and test methods with achievable limit values will be addressed and recommendations will be issued

Time Schedule

First communication at the CIGRE B3 SC meeting in Nikko (September 2005).
Final document completed in December 2006.
Further publication as separate CIGRE brochure by March 2007.

Target groups

Top management, operators, consultants, asset management CIGRE organization, Environmental Groups

Approved by TC Chairmen : Aldo Bolza
: May 29, 2006

Date