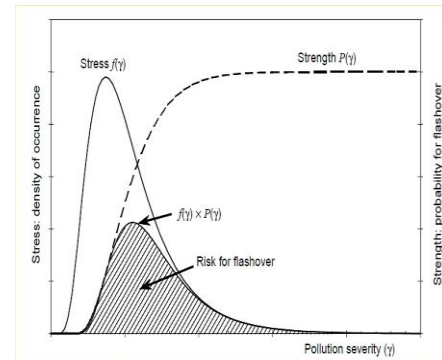


Cost-Effective Pollution Testing

Optimal Insulation Selection

Optimal insulation dimensioning can be achieved only through application of statistical methods. These methods have for decades been used for insulation coordination, but at present are also well established for dimensioning of insulators in polluted areas (IEC TS 60815-1). To apply statistical approach, one should know the environment and the flashover pollution performance of insulators in question. Then the insulation can be selected based on desired availability requirements (outage rate).

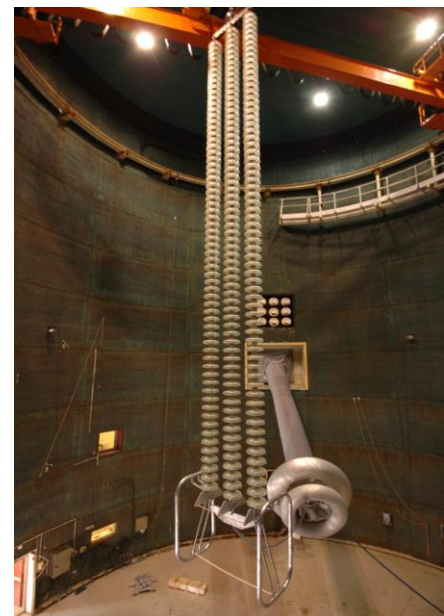


Standard/customized pollution tests up to UHV level

In STRI's climate test hall (18 m in diameter and 24 m in height) it is possible to perform pollution testing of full-scale insulators up to 900 kV AC and ± 1200 kV DC. Pollution testing can be performed in accordance with IEC 60507 and IEC 61245 for ceramic insulators and also according to CIGRE Technical Brochure 555 for composite insulators. In a smaller climatic chamber of 45 m³ volume it is also possible to perform pollution testing of insulators up to 145 kV class. STRI provides both tests based on solid layer (for inland environment) and based on salt fog (for coastal environment). STRI also provides pollution performance (flashover voltage over site severity) of any type of insulators including AC and DC ceramic (porcelain and glass), RTV-coated, composite and hybrid. Such data was for example used for Fennoskan-2 at Fingrid, refurbishment of 420 kV AC OHL at ESKOM, refurbishment of ± 533 kV Cahora-Bassa at ESKOM, upgrade of 300 kV AC OHL at Statnett, upgrade of ± 350 kV Skagerrak at Statnett, etc.

STRI also performs customized simulations of specific service cases, e.g.:

- Pollution and ice (made for Canada)
- Ice and salt fog (made for Iceland)
- Natural desert sand and salt (made for Tunisia)
- Specific industrial contamination (made for Sweden)
- Ice and snow with defined properties (made for Japan)



Cost-Effective Pollution Testing

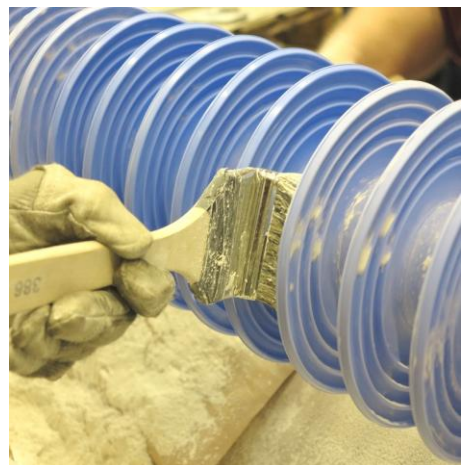
Cost-effective pollution testing

STRI is pioneering in non-standard cost-effective pollution test methods using the so-called rapid voltage procedures, which cover both artificially and naturally contaminated insulators. STRI leads the international development of such test methods in CIGRE (working group D1.44) taking the position of convener. This method allows to reduce test time by 3-5 times [1]-[3].

STRI provides custom-optimized methods for time- and cost-effective evaluation of pollution performance of any type of insulator including AC and DC ceramic (porcelain and glass), RTV-coated, composite and hybrid. The test can simulate different hydrophobicity properties of composite insulators.

References

- [1] I. Gutman, J. Shamsujjoha, C. Lumb, J.-M. George, S. Roude: "Investigation Of Rapid Flashover Solid Layer Pollution Testing As An Alternative To Current Standard Methods", IEEE ISEI-2012, paper 17, p.p. 73-77
- [2] I. Gutman, J. Lundengård, W. Vosloo: "Development of Time- and Cost-Effective Pollution Test Methods Applicable for Different Station Insulation Options", IEEE Transactions on DEI, Vol. 21, No. 6, December 2014, p.p. 2525-2530
- [3] I. Gutman, J. Lundengård: "Time-Effective Rapid Test Procedures for Pollution Testing of Different Types of Insulators", World Congress & Exhibition on Insulators, Arresters & Bushings, Munich, Germany, 18-21 October 2015



For more information please email stri@stri.se or visit our website