JICABLE'07
Rapporteur's Session Report

C.5.2 SESSION : CABLE INSTALLATION AND RATING

Chairman : H. ORTON – ORTON Consulting Ing, Canada
Rapporteur : A. CHAUVANCY, RTE CNER, France

This poster session, which included nine reports, was dedicated to cable installation and rating. The rating of power cable is a very important subject for utilities which try to optimize as much as possible power transmission capacity of a cable. Rating is the concern of papers 5.2.1, 5.2.2, 5.2.3 and 5.2.4. Rating is also closely linked to installations which are the subjects of the next five papers 5.2.4 to 5.2.9.

Paper 5.2.1 addresses ampacity calculations for conventional duct-bank installation, by considering duct-bank layouts, burial depth and its temperature dependence, different thermal resistivities of backfill, soil and CBS. Furthermore, a multi-physical FEM-calculation shows the effect on the ampacity when cables are installed in steel pipes, for example an HDD-boring under a river, railway or similar.

In Paper 5.2.2, LS Cable, Korea Electric Power Corporation, developed a Real-Time Ampacity Estimation System (R-TAS) which consists of Distributed Temperature Sensor (DTS) and Conductor Temperature Monitoring module (CTM) and Dynamic Rating System (DRS). It was applied starting from Malaysia 132kV underground cable in 2003. Until now, more than eight countries have adapted this system in underground transmission cable system including Korea, Qatar, Saudi Arabia, Jordan and Hong Kong.

In Paper 5.2.3, an RTTR-system has been developed, which is able for customery to derive from measured temperatures and currents the necessary predictions of heating trends and/or of a available load reserves, respectively. Critical system conditions can be identified at an early stage and transferred to adequate alerts for the operator.

Paper 5.2.4 deals with dynamic rating regime experience and temperature measurement experience. The report conclude with the possibility of using both of this methods to (re-)established the rating of an existing cable.

Due to environmental constraints or regulation, mainly in cities, is it more and more difficult to realize "excavation" of roads to lay underground lines. Methods such as directional drilling is developed in paper 5.2.5. For this laying technique a mortar between the concrete pipe and ducts is necessary to keep good rating. In this report they are focusing on a new specific mortar that has high fluidity and stable thermal resistivity that doesn't reach more than 1.0 Km/W while cable is heating.

Paper 5.2.6 deals with engineering guidance to provide the sharing of existing infrastructures.→ poster missing

Paper 5.2.7 deals with fire prevention methods to prevent expansion to all cables inside a tunnel for example. TEPCO showed that Oil-Filled cable joint fault in a tunnel may cause a fire whereas an XLPE cable doesn't.

Paper 5.2.8 presents a new device to reduce the sheath circulating current by installing a reactor to the cross bonding lead where the current increased and describes its efficacy.

Paper C.5.2.9 gives some examples of application of the aforementioned multi conductor procedures :

- MV multiple double-circuit cross-bonded cables,
- EHV XLPE double-circuit cross-bonded cables in tunnel installation.