JICABLE'07 Rapporteur's Session Report

A.6 SESSION : HV / EHV CABLES – OPERATING CONSIDERATIONS

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This session, which includes an invited paper and five other papers, was dedicated to the underground cables operating and maintenance considerations : new devices are presented to help optimising the operation of the grid, and methods about maintenance or reliability of installed cables were also exposed.

The invited paper presented the CIGRE study Committee B1 organization and activities.

The chairman of Korea CIGRE national committee made a proposal for the 2011 B1 CIGRE session in Gochang, Korea.

As the underground cable use is improving amongst an already-installed overhead lines grid, serious mismatch between load flows in cables and overhead lines would happen : cables generate much more reactive power than overhead lines, and display smaller series reactances, which make the control of system voltage necessary. The paper A.6.1 presented some means to reduce or to eliminate such mismatch : Flexible AC transmission Systems (FACTS) such as Static Var Compensators (SVC) or Series capacitors. And some real applications of these FACTS are also presented.

The power network in Kuwait is run by the government through the ministry of Energy. The paper A.6.2 presented how the ministry has undertaken the maintenance concerns by outsourcing the preventive part on power cables, after good experience with OHL, and substations. As the preventive maintenance could predict faults and could point at the weak part of the grid, outsourcing this maintenance may help to regulate and make it more effective. But if this method has advantages, it also has some disadvantages that must be measured to be well taken into account in the contract. After experience, contract costs have been reduced.

The paper A.6.3 dealt with the failure prediction in 50kV mass-insulated power cable systems, with statistical analysis. This analysis can help an asset manager to determine if an immediate replacement has to be taken, or in the future to obtain the required reliability of the network. It can also be used to estimate the B-lives of the network in service. This analysis conducted on 56 km cables used life time data and failure data to predict the occurrence of failures in coming years.

The paper A.6.4 demonstrated the using of the modified FIPEC horizontal reference test
 Scenario to evaluate the fire performance of cables installed within tunnels. It also showed that a cable without flame retardant properties, especially EHV cable, would lead to catastrophic consequences if involved in a fire : a complete destruction of the tunnel contents and significant structural damages to the tunnel could happen, due to the heat generation, the temperature increase, and the lack of visibility. The opportunities for the fire fighter to access are also very limited. The presence of a flame retardant sheath on MV cable was demonstrated to be a quantified benefit.

The rating power is a very important subject for utilities, even for the overhead lines than for underground cable. The paper A.6.5 described how a dynamic rating method has been performed in a hybrid 150 kV system in Amsterdam. This method consists in modelling thermally the bottlenecks of the lines, their environment (soil, air temperature, weather). The results of this modelling were checked by real temperature measurements : the curves had the same shape than the measured ones. The usefulness of dynamic rating is obvious but some challenges still remain to concretise the use.