

**A1.3****The high voltage cables in the ivorian power system**

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1. ABSTRACT**1.1. Français**

Le réseau électrique ivoirien est exploité en 380V triphasé et 220 V monophasé pour la basse tension en 15 et 30 kV pour la moyenne tension et en 90 et 225 kV pour la haute tension. La longueur totale de ce réseau est de 25 841 km dont 2389 sont enterrés soit à peine 7%.

La faible proportion du réseau souterrain s'explique par son coût encore très élevé comparativement à l'aérien. L'option du souterrains est imposée par des contraintes environnementales : forte densité de population et traversées sous marine.

Les principales difficultés rencontrées dans l'exploitation des réseaux souterrains ivoiriens sont : les fréquentes avaries des câbles provoquées par les engins de travaux publics, la forte érosion des sols modifiant les conditions d'enfouissement des câbles, les actes de vandalisme, l'absence de cartographie fiable.

1.2. English

The ivorian power system operates at the following voltage levels :

Low voltage :380V in three phase and 220 V in one phase.

Mean voltage :15 and 30 kV

high voltage : 90 and 225 kV

The total length of the hole network is 25 841 km from which 2389 km are buried representing less than 7%.

The poor proportion of underground network is due to its expensiveness when compared to the aerial one. The choice of underground cables is imposed by some environmental constraints: high population density, and under river or submarine crossings.

The main difficulties met in the exploitation of the ivorian underground networks are: the frequent damages caused in the cables by the civil working engines, the strong erosion of the soils that modifies the burying conditions of the cables, the misdeed of plunders, the absence of reliable cartography.

2. PRESENTATION OF THE IVORIAN ELECTRICAL NETWORK

The ivorian electrical network consists of the following voltage levels:

Low voltage:

380 V in three phase and 220 V in one phase : used for domestic and small shops feeding.

This network is composed of 9450 km of aerial lines and 1270 km of underground lines. [1]

Mean voltage:

30 000 and 15 000 V: used to transmit the energy to the small agglomerations, the big shops, and the manufactories.

This network is composed of 12 800 km of aerial lines and 1120 km of underground connections. [1]

High and very high voltage:***High voltage: 90 kV***

Voltage level used for supplying of the big towns and big manufactories such as textile and refinery industries.

This network is composed 30 substations, 43 aerial lines with a total length 7308 km, and 3 underground lines totalling 7,5 km. [2]

The thin underground network exists only in the dense urban area of Abidjan, the economical capital.

Very high voltage: 225 kV

This voltage level is concerned by an interconnected network joining the power stations to the big regions of the country and to the bordering countries.

This network is composed 12 substations and 3903 km of overhead lines and 0,5 km of underground connections [2]