

## Qualification of a fully dry 225 kV cable system from outdoor terminations to GIS & transformer terminations

Pierre **MIREBEAU**, Nexans, (France), [pierre.mirebeau@nexans.com](mailto:pierre.mirebeau@nexans.com)

Abdellatif **AIT AMAR**, Nexans, (France), [abdellatif.ait\\_amar@nexans.com](mailto:abdellatif.ait_amar@nexans.com)

Nicolas **LALLOUET**, Nexans, (France), [nicolas.lallouet@nexans.com](mailto:nicolas.lallouet@nexans.com)

François **GAHUNGU**, FGC, (France), [francois.gahungu@orange.fr](mailto:francois.gahungu@orange.fr)

Pascal **STREIT**, Bouygues E&S EnerTrans SA, (Switzerland), [pascal.streit@bouygues-es.com](mailto:pascal.streit@bouygues-es.com)

### ABSTRACT

*The need to preserve the environment pushes the manufacturers to develop products based on inert materials, with the minimum environmental impact in any condition, including electrical events such as fire, or breakdown.*

*This need has led to dry (i.e. fluid free) cable systems and components in medium voltage and currently up to 150 (170) kV.*

*This paper presents the design and full qualification at a higher voltage, i.e. the 225 (245) kV level of a complete dry cable system according to IEC 62067.*

- Cable
- Joint
- GIS termination
- Transformer termination
- Outdoor termination

### KEYWORDS

Land Cable system, safety, maintenance.

### INTRODUCTION

Since long an extensive work has been performed to decrease maintenance and environmental impact of cable systems.

The transition from oil filled cables to extruded cables began in 1969 with the first long term test at 225kV on an extruded cable system [1]

The work to move from field joints to prefabricated ones started later, especially with one piece premoulded joints in 1986 [2]

And then the move from fluid filled terminations to dry ones began in 1991 [3], going step by step from low high voltage to 150kV.

At the 225 (245) kV level, Gel filled terminations were developed [4]

This paper shows the design and performance of a fully dry cable system using only solid components, as they have been presented in JICABLE 11 [5]

### THE CABLE SYSTEM

The cable system consisted in a cable, a joint, a GIS termination inner cone design, a GIS termination outer cone design, an outdoor termination, a transformer termination.

The cable has the following characteristics:

component	nominal thickness mm	Approx. diameter mm
Conductor 2000mm <sup>2</sup> alu		56.0
conductor extruded semi- conductive screen	2	60.8
insulation	17.5	95.8
insulation extruded semi- conductive screen	1.3	98.4
Metal sheath	2.5	104.8
Extruded Polyethylene oversheath	5.1	114.7

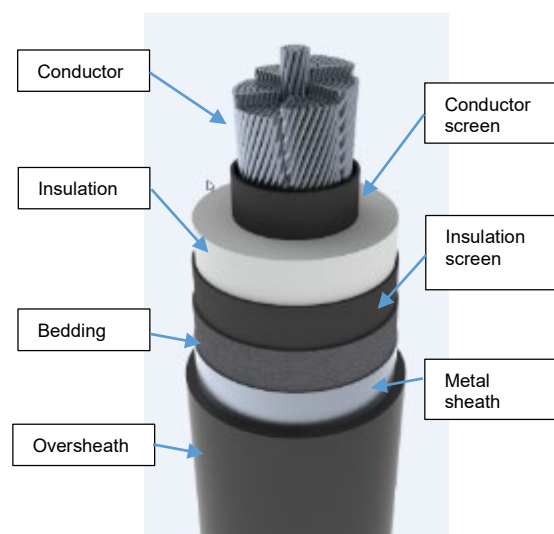


Fig. 1: Cable design