

THE WORLD FIRST 500KV XLPE UNDERGROUND CABLE SYSTEM WITH PREFABRICATED JOINT IN CHINA

Hai Ngiing **WONG**(1), Shunsuke **ABE**(1), Shoji **YAMAMOTO**(1), Yasuo **Torai**(1)

Yun **JIANG** (2), Hao **FANG**(2), Wen Wei **YANG** (2)

1: VISCAS Corporation. 4-12-2 Higashi-shinagawa Shinagawa-ku Tokyo, 140-0002, Japan,

h-wong@viscas.com, s-abe@viscas.com, s-yamamoto@viscas.com, y-torai@viscas.com

2: Shanghai Municipal Electrical Power Company, Shanghai, China,

malan@sh163.net, fangh@sepd.com.cn, yangww@sh.sgcc.com.cn

ABSTRACT

With the actual field application of 400kV Prefabricated joints in the metropolitan area of Copenhagen, Denmark since July, 1997, in addition to this proven record, continuous development & research of 500kV prefabrication joint & its system had been conducted among VISCAS and other major cable manufacturers and the Utilities. A series of aging tests had also been conducted with objectives, all the verification performances were sufficient and able to meet with a life equivalent to 30 years or more. Actual field application were implemented with advanced tunnel design, sophisticate laying method & system, intensive trained high skill manpower and close cooperation among the parties contribute to the adoption of this 500kV XLPE cables & prefabricated joints to this honourably important Shanghai Expo transmission circuit. The Project was executed at tremendous progress and smooth pace than expected and accomplished the obligatory commercial operation in due date and keep thriving at its best condition without trouble till now.

KEYWORDS

500kV XLPE Power cable, Prefabrication joints (PJ), Shanghai World Exposition 2010

1. INTRODUCTION

With the continuous expansion and in response to the Shanghai City World Expo 2010 skyrocketing and steady demand of electricity necessity, the 500kV underground cable system was studied and implemented.

Maturity of XLPE insulated cable compare to oil-filled type, type of joint i.e. prefabricated, field-extruded molded and one-piece premolded joint had been the key parameters for selection.

Availability technologies and proven actual job references;

- ✓ Research & development of prefabricated joint for 500kV XLPE cable was conducted since early 1990 and long term aging test was completed in March 2002. A series of tests verified the performances were sufficiently satisfactory and had a life equivalent to 30 years or more.
- ✓ Worlds first 420kV XLPE extruded cable with prefabricated joints developed by VISCAS Corp. and implemented by NKT for Copenhagen, Denmark had been adopted in 1997. A total of 72 phases of prefabricated in the 22km transmission network. The circuit had since serviced without any interruption.
- ✓ Worlds first 500kV XLPE extruded cable with 268 phases of field-extruded molded joints supplied by VISCAS and other major Japanese manufacturers in Tokyo area were energized in 2000 and has high reliability and contribute greatly to the high-power stable supply to the mega-metropolitan area.

Extruded XLPE cables have been chosen as of above-mentioned proven records, higher transmission capacity, lower losses and no risk of oil leakage, pollution and shorter installation time.

The cables and its accessories were designed, manufactured and shipped to the site from Sept. 2008. The installation & erection of the Prefabricated joints were initiated in Feb., 2009 under the supplier supervision and our intensively trained jointers. The Project was managed to finish the works in March 2010, i.e. just a month ahead of the Shanghai City World Expo 2010 started. The circuit was then undergone commissioning test and partial discharge test in early April. The circuit was successfully energized and put into commercial operation from 16th April, 2010. The transmission system has been targeted at providing secure & steady power supply to the Shanghai city World Exposition 2010 and accomplished the objective as scheduled.