

# The First Application of the Premolded Joint to 275kV XLPE Cable Line in Japan

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## ABSTRACT

The 275kV Suruga-Higashishimizu line is the first XLPE cable with the premolded joints in Japan. It was necessary to establish our own quality standards through numerous rigorous testing iterations. Following installation, our AC withstand voltage test and partial discharge measurement have confirmed the successful installation of the cable.

## KEYWORDS

AC withstand voltage test, Partial discharge measurement  
 Quality control of the joints

## INTRODUCTION

The 275kV Suruga-Higashishimizu line, which is composed of 3km of XLPE cable in route, was completed in November 2013. We adopted the 275kV XLPE cable with a copper wire screen and stainless sheath inside a PVC jacket and applied 275kV Premolded Joint (PMJ) to the site for the first time in Japan.

The tunnel has about a 60m high shaft and a steep slope (angle 14°, length 700m). To establish the method for placing the cables in these difficult conditions we confirmed the process by using a sample cable with the length of 180m. The sample cable was pulled through the same route of the actual cables, and it was confirmed that the sample cable was intact via dismantlement.

Quality control was considered to be important to the application of the 275kV PMJ, but there was no criterion for quality control before in my company. We created it by repeating the simulation tests to check the validity of the installed line, including the 275 PMJs, we conducted a withstand voltage test and measured the partial discharge.

## CONSTRUCTION SUMMARY

### Cable structure

For this installation, 275kV1x2,500sq XLPE cables with stainless jacket were used. A cross section view is shown in figure 1.

### Joint structure

The PMJs are superior to the former type joints for their construction characteristics. It keeps interfacial insulation performance by a retraction from rubber. A cross section view is shown figure 2.

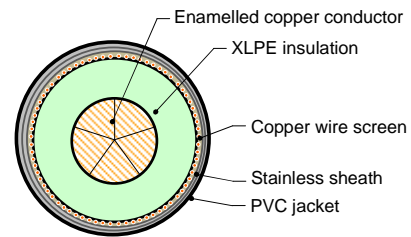


Fig.1: 275kV 2,500sq XLPE Cable with stainless sheath

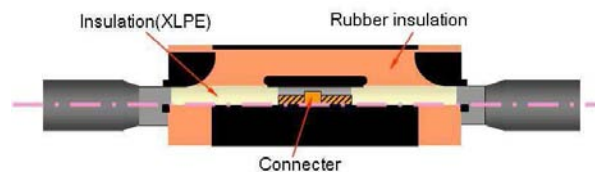


Fig.2 : Premolded joint for 275kV XLPE cable

## Outline of Suruga-Higashishimizu line

The components and an overview of the Suruga-Higashishimizu line are shown below in table 1 and figure 3.

Table.1 : Components of Suruga-Higashishimizu line

Cable	275 kV XLPE 2500 mm <sup>2</sup> 2circuits(Double conductor)
Termination	Outdoor termination GIS termination
Joint	Premolded joint

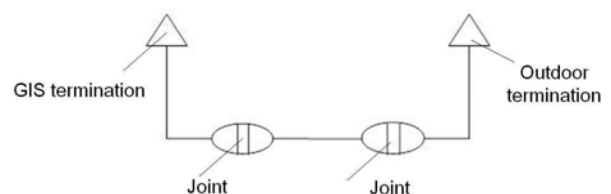


Fig.3 Overview of the Suruga-Higashishimizu line