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Completion of prefabricated joint for 500 kV XLPE cable

KOBASHI K., The Kansai Electric Power Co. Inc., Japan

BAN S., J-Power Systems Co., Japan

KANAOKA M., J-Power Systems Co., Japan

YONEMURA T., The Furukawa Electric Co. Ltd, Japan

NIINOBE H., Fujikura Ltd., Japan

Abstract: The design and the initial electric performance of the compact prefabricated joint (PJ) for 500 kV XLPE cable was reported at Jicable '99 forum[1].

This paper reviews the technical changes of PJs in Japan and describes the results of a long-term aging test for the PJs and the measures of time reduction for installing PJs, and the initial electrical performance of the SF₆ termination(EB-G).

The long-term aging test was finished in March 2002. The test results demonstrated that the long-term performance of the developed 500 kV PJs and EB-Gs were sufficiently satisfactory and had a life equivalent to 30 years or more.

Keywords: 500 kV, XLPE cable, prefabricated joint,

1. Introduction

Although an extrusion molded joint (EMJ) had already been developed as a joint for 500 kV XLPE cables [2-3], the development of a joint with a size equivalent to EMJ, easy quality control during installation work, and a shorter installation time is desired. Because, for EMJs, a variety of quality control is required on-site and the installation takes a long time. The PJ was one of the joints that satisfied these requirements.

Although PJs have actually been used as the joints for 275 kV XLPE cable, it was necessary to achieve further size and installation time reductions for application to 500 kV XLPE cable.

The design and the test results of initial electrical performance of newly compact 500 kV PJ were reported at the Jicable'99 forum [1]. Following this, a long-term aging test for the developed 500 kV PJ and the dry type EB-G developed at the same time was

Résumé: La réunion Jicable '99 [1] a rendu compte des résultats sur la conception du joint préfabriqué 500kV et son évaluation initiale de performances électriques. Le présent dossier décrit ci-après les résultats des essais de conduction à long terme de la voie de câble du joint préfabriqué testé et la réduction du temps de travaux dans la réalisation du joint préfabriqué ainsi que les performances électriques de l'extrémité isolée à l'immersion de gaz SF₆ testée pour la voie de câble de conduction à long terme.

Les essais de conduction à long terme, conclus au mois de mars 2002, certifient que le joint préfabriqué 500kV et l'extrémité isolée à l'immersion de gaz testés ont été évalués satisfaisants au niveau de la propriété de performances à long terme, à savoir avoir une tenue équivalente à plus de trente ans.

Mots clés: 500kV, câble XLPE, Le joint préfabriqué

conducted as the final stage of development from August 2001 and used four PJs and two EB-Gs to complete the tests in March 2002.

This paper reviews the technical changes in extra-high voltage PJs in Japan and describes the measures for reducing the installation time, the improvement of on-site quality control in PJ installation, the initial electrical performance of the EB-G, and the long-term aging test results of the 500 kV PJ testing line.

A series of tests verified that the long-term performance of developed 500 kV PJs and EB-Gs were sufficiently satisfactory and had a life equivalent to 30 years or more. Thus the development of compact 500 kV PJ enabled the construction of long distance 500 kV XLPE transmission lines in a short period of time.