INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

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OF ITU

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SERIES L: CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

External additional protection for marinized terrestrial cables

ITU-T Recommendation L.28

(Previously CCITT Recommendation)

ITU-T L-SERIES RECOMMENDATIONS

CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

For further details, please refer to ITU-T List of Recommendations.

FOREWORD

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation L.28, was prepared by ITU-T Study Group 6 (1993-1996) and was approved by the WTSC (Geneva, 9-18 October, 1996).

NOTES

1. In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

2. The status of annexes and appendices attached to the Series L Recommendations should be interpreted as follows:

- an *annex* to a Recommendation forms an integral part of the Recommendation;
- an *appendix* to a Recommendation does not form part of the Recommendation and only provides some complementary explanation or information specific to that Recommendation.

Recommendation L.28

EXTERNAL ADDITIONAL PROTECTION FOR MARINIZED TERRESTRIAL CABLES

(Geneva, 1996)

Introduction

A marinized terrestrial cable is an underwater optical fibre cable construction, based on a conventional multi-fibre terrestrial cable core protected to withstand the marine environment, designed for unrepeated applications and tested for use in non-aggressive shallow waters, with a varying repair capability.

Cables are designed with a predicted lifetime taking into account either cable replacement or a certain number of repairs.

For shallow-water cables the probability of failures is higher than for deep-water application due to environmental phenomena (for example, wave motion, underwater earthquakes and landslides, etc.) and human activities affecting the sea bed (for example, fishing, laying and maintenance of other services and cables).

In addition to the various armouring usually adopted in the cable structures (for example, DA – double armour and SA – single armour), additional external protections can be adopted. Such protections can be installed both approaching the coast and in shallow water, or along the cable route where external factors could damage the cables.

Where it is necessary to meet the predicted lifetime and the cable reliability requirements:

It is recommended

that the following external protections are adopted in areas where cable armouring protection is insufficient or inappropriate:

– *soft bottom* (for example, sand)

  In the shore end portion (for example, up to a water depth, of 30 to 40 m), the cable should be buried at least 1 m (for example, by divers with a jetting method). In shallow water, along the cable route where necessary, the burial is performed using plowing or jetting machinery. Usually, due to its softness, the sand will naturally backfill the burial.

– *hard bottom*

  When one of the following conditions, up to 200 m from the water line or 5 m in depth, is reached or if the hardness of the soil (for example, rocks, biotherm) does not allow burials, the cable should be secured and protected (for example, by means of cast-iron half-shells duly secured to the soil in order to avoid movements of the half shell protection due to wave motion). In areas where these shells are liable to damage, the articulated pipeline should be protected by concrete-gravel sacks clamped to one another.

– *crossing*

  When a crossing is foreseen, the cable route and the cable protection, as well as the installation method, have to be determined by the parties concerned.

  In the case of a crossing of an already installed cable by gas, oil pipelines, etc., the cable should be suitably protected with devices (for example, mattresses) able to avoid any damage during the pipeline laying, maintenance and operation.

Similar protections should be adopted when a cable has to cross an already existing pipeline, if:

– the pipeline carries warm substances (for example, oil ducts in the proximity of the wells), which temperature could modify or damage the external sheath or the tar protecting the steel wire armouring of the cable in proximity of the contact point between cable and pipeline;

– the contact between pipeline and cable could lead to the generation of corrosion due to galvanic currents if cathode protection is not used;

– mechanical friction between pipeline and cable, due to the water motion, could damage the cable.

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