INTERNATIONAL TELECOMMUNICATION UNION

ITU-T G.971

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

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DIGITAL SECTIONS AND DIGITAL LINE SYSTEMS

GENERAL FEATURES OF OPTICAL FIBRE SUBMARINE CABLE SYSTEMS

ITU-T Recommendation G.971

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. 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, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation G.971 was prepared by the ITU-T Study Group XV (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

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

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GENERAL FEATURES OF OPTICAL FIBRE SUBMARINE CABLE SYSTEMS

(Helsinki, 1993)

The purpose of this Recommendation is to identify the main features of optical fibre submarine cable systems.

An optical fibre submarine cable system has specific tecnical features:

1) A submarine cable system should achieve a long lifetime and a high reliability; the main reason is that due to the difficulty in accessing the submerged plant, the construction and maintenance of a link are long and expensive; moreover most submarine links are of strategic importance in the transmission network and the interruption of a link usually results in significant loss of traffic and revenue.

2) A submarine cable system should possess mechanical characteristics which enable it

   – to be installed accurately with correct slack and with due safety consideration on the sea bed; deep water installations may reach 8000 meters;

   – to resist the sea bottom environment condition at the installation depth, and particularly hydrostatic pressure, temperature, abrasion, corrosion, and marine life;

   – to be adequately protected (i.e. by armouring or burying) against aggression, due for example to trawlers or anchors;

   – to survive recovery from such a depth, and subsequent repair and relay, with due safety consideration.

3) The material characteristics of a submarine cable system should enable the optical fibre

   – to achieve its desired reliability over its design lifetime;

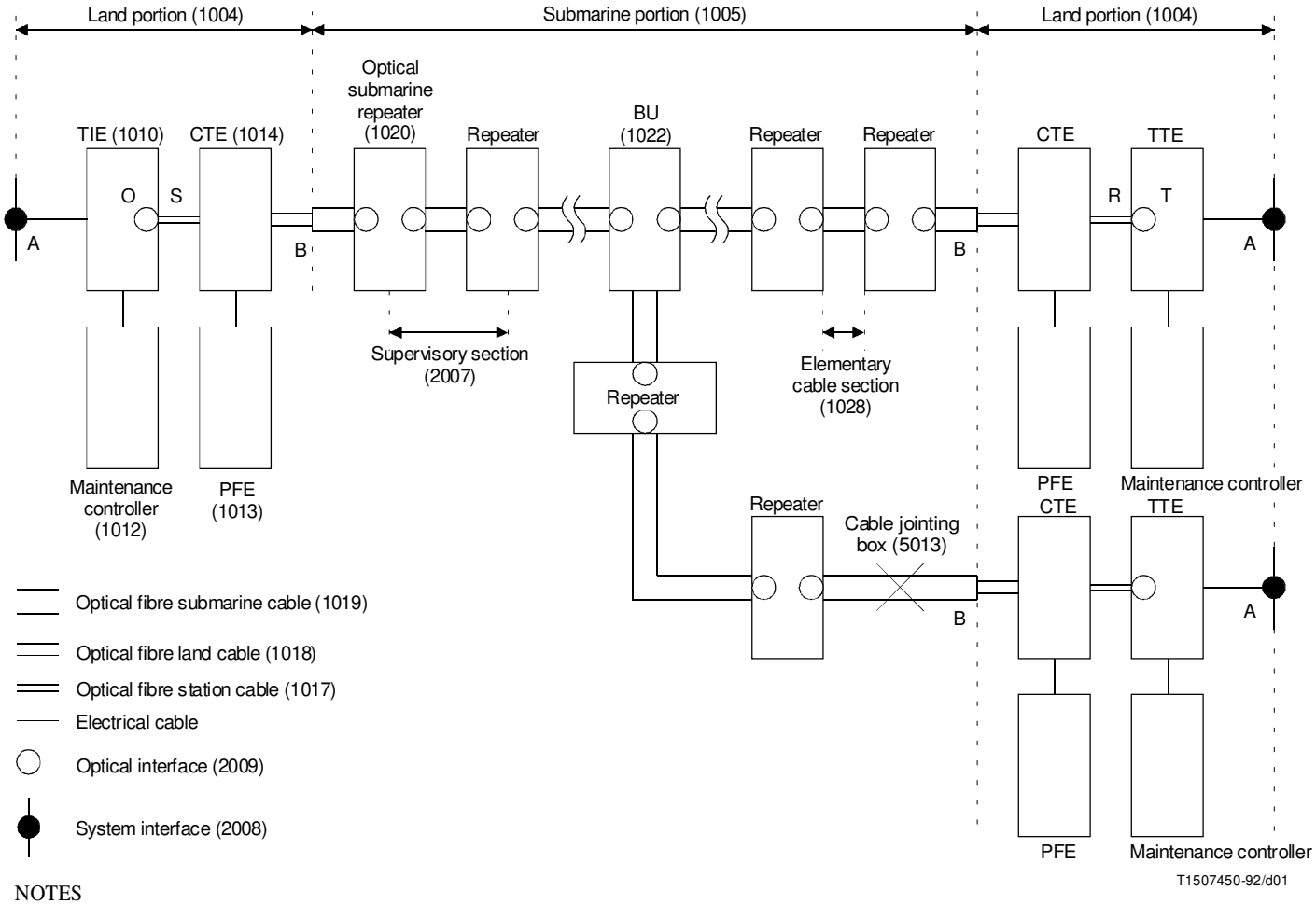
   – to tolerate stated loss and ageing mechanisms, especially bending, strain, hydrogen, stress, corrosion and radiation.

4) The tranmission quality of a submarine cable system should follow as a minimum Recommendation G.821.

Figure 1 shows the basic concept of optical fibre submarine cable systems ans boundaries. Optical submarine repeaters or optical submarine branching units could be included, depending on each system requirement.

In Figure 1, A denotes the system interfaces at the terminal station (where the system can be interfaced to terrestrial digital links or to other submarine cable systems), and B denotes beach joints or landing points. Letters in brackets in the following sections and in the definitions of Recommendation G.972 refer to the above figure.

Relationship among the various Recommendations pertaining to optical fibre submarine cable systems are shown in the flow chart presented in Figure 2.



NOTES
1 A denotes system interface.
2 B denotes landing points or beach joints (1006).
3 X denotes cable jointing box (5013).
4 Numbers in brackets relate to G.972.

FIGURE 1/G.971

Example of optical fibre submarine cable systems

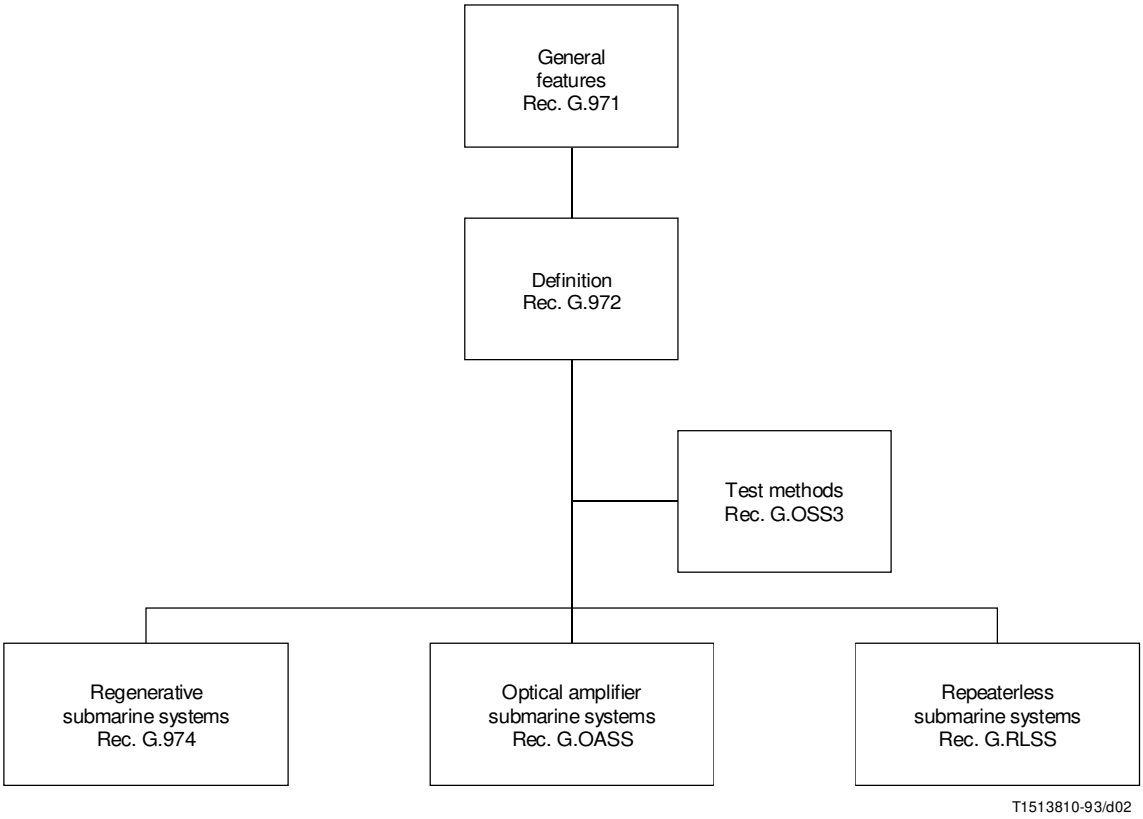


FIGURE 2/G.971

Working flow chart of Recommendations for optical fibre submarine cable systems