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**ITU-T**

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**INTERNATIONAL PUBLIC TELEPHONE  
NETWORK MAINTENANCE**

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**USE OF AUTOMATICALLY GENERATED  
TEST CALLS FOR ASSESSMENT  
OF NETWORK PERFORMANCE**

**ITU-T Recommendation M.1235**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation M.1235 was published in Fascicle IV.2 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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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## **Recommendation M.1235**

### **USE OF AUTOMATICALLY GENERATED TEST CALLS FOR ASSESSMENT OF NETWORK PERFORMANCE**

#### **1 General**

1.1 This Recommendation describes the use of automatic subscriber-to-subscriber test calls as one of the methods for assessing overall network performance [1]. It is intended as a basis for bilateral or multilateral agreements between Administrations interested in this method of investigating network performance.

1.2 In correspondence with the objectives of efficient maintenance methods as described in Recommendation M.730 [2] and, in particular, in line with the application of controlled maintenance methods as explained in § 4 of Recommendation M.730 [2], there is a recognized need to continuously assess network performance.

1.3 Considering the fact that an international call engages both national and international links, any method for assessing overall network performance should cover the entire chain of national and international links.

1.4 Modern switching and transmission systems may have built-in facilities for checking the overall network performance by means of test calls set up automatically from the exchange of origin to the exchange of destination of international calls. Similar facilities may be provided by independent test call generators having access to the switching multiple at the exchange of origin and making test calls to various test call responders in distant countries. Such test call responders may be connected to test numbers in various terminal exchanges in the distant country.

1.5 Automatic subscriber-to-subscriber test calls performed either by system-independent test call generators and test call responders, or by built-in facilities performing the same functions, can be applied in bilateral test call programmes involving the networks of two Administrations or regional programmes involving more than two Administrations. It is important that such programmes are well planned and not interfered with by the use of the same test number for other purposes as well.

1.6 In order to reflect the real network performance, test call programmes should be carried out both during non-busy and busy periods. The number of test calls to be generated on each selected route will depend on the frequency of difficulties encountered on the route and is independent of the traffic load carried on the route, or the size of the route. In other words, the higher the fault frequency, the fewer test calls will be required to arrive at statistically significant results. Considering that most of a test generator's occupation time is used for sending address information to its own national switching equipment, international links and national links in the distant country are only occupied for a very short time by a test call. The additional load created by test call generators on international traffic routes is therefore normally negligible even on very small routes.

1.7 It should be stressed that test call programmes of the type described here always necessitate an agreement between Administrations concerned.

#### **2 Methods of assessment**

##### *2.1 Distribution of test call facilities*

For practical purposes it is quite sufficient to generate, and observe, test calls from a few major traffic points in the originating country to a few major points in the distant country.

##### *2.2 Programming of test call traffic*

In order to avoid interference with other test calls, test call programmes should be carefully planned and agreed upon by the parties concerned. It might be advisable to prepare periodical test call programmes for bilateral exchange between Administrations. Test calls should, if possible, also be evenly distributed over a period of time including both non-busy and busy periods of traffic.

### 2.3 *Number of test calls*

The number of test calls to be generated to each selected destination is only dependent on the frequency of difficulties encountered and is independent of the traffic load carried to that destination. Fewer test calls are needed to identify the network performance level when the rate of difficulty encountered is high.

The number of test calls to be generated in a test call programme for a defined period of time can normally be divided between all destinations to be tested. It is recommended, however, that a certain proportion of the total test call production capacity be utilized for special fault investigations on certain indicated destinations.

### 2.4 *Result of test call programmes*

Network performance may be expressed as the ratio of successful to total test call attempts to a certain international destination during a period of time. The accuracy of the results of the test calls may be judged by ordinary statistical methods.

The definition of a successful or unsuccessful call is, to some extent, dependent on the range of tests being interchanged between the test call generator and the responder. In general, the following criteria must be met by a successful test call:

- i) the called party answers,
- ii) acceptable general transmission quality,
- iii) correct charging,
- iv) correct disconnection of the call.

Furthermore, certain test facilities may be designed to carry out more stringent test programmes under the network performance concept.

The unsuccessful calls should be specified with regard to the type of fault which occurred.

### 2.5 *Reports and exchange of information*

Administrations involved in test call programmes are urged to exchange test results regularly.

An unusually high number of network difficulties encountered in a test call programme should be treated as a fault report and be dealt with according to fault reporting procedures, without interrupting the test call programme.

It is recommended that the Administration making test calls should be responsible for the compilation of the results of those tests.

## **3 Equipment**

As tone signals and other local conditions vary from one national network to another, test call generators and responders must be specifically designed for each international application. Furthermore, test call generators may be designed to interwork with responders in the distant country, which regenerate test calls back to the country of origin.

Until such time as Recommendations are available giving the specifications for test call generating and responding equipments, it is recommended that Administrations initiating test call programmes supply the responders required.

### **References**

- [1] CCITT Recommendation *Test calls*, Vol. II, Rec. E.424.
- [2] CCITT Recommendation *Maintenance methods*, Vol. IV, Rec. M.730.