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International operation – General provisions concerning
Administrations

**International Emergency Preference
Scheme (IEPS) for disaster relief operations**

ITU-T Recommendation E.106

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ITU-T Recommendation E.106

International Emergency Preference Scheme (IEPS) for disaster relief operations

Summary

This Recommendation describes an international preference scheme for the use of public telecommunications by national authorities for emergency and disaster relief operations. The International Emergency Preference Scheme for Disaster Relief Operations (IEPS) is needed when there is a crisis situation causing an increased demand for telecommunications when use of the International Telephone Service may be restricted due to damage, reduced capacity, congestion or faults. In crisis situations there is a requirement for IEPS users of public telecommunications to have preferential treatment.

Source

ITU-T Recommendation E.106 was approved by ITU-T Study Group 2 (2001-2004) under the WTSA Resolution 1 on 31 October 2003.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. 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 Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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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Introduction

In a crisis situation, there is a need for telecommunications among IEPS users of public telecommunications networks, such as the PSTN, ISDN or PLMN. These communications, which are regarded as essential, will be needed at the same time as the public will be attempting an increased number of calls during the period when the telecommunications networks may be restricted due to damage, congestion or faults.

Many countries have, or are developing, national preference schemes to allow preferential treatment for such national traffic. However, during a crisis, it is important for an international support scheme to allow communications between the IEPS users in one country and their correspondents in another. The International Emergency Preference Scheme for Disaster Relief Operations (IEPS) addresses this international support scheme.

This preference scheme is only intended for use by IEPS users to be able to place calls with preference. Public emergency services, on the other hand, are intended for use by members of the general public to request services such as fire, police, and medical. They are often invoked by a short access code.

ITU-T Recommendation E.106

International Emergency Preference Scheme (IEPS) for disaster relief operations

1 Scope

The IEPS enables the use of public telecommunications by national authorities for emergency and disaster relief operations. It allows users, authorized by national authorities, to have access to the International Telephone Service, as described in ITU-T Rec. E.105 [1], while this service is restricted either due to damage, congestion or faults, or any combination of these. This Recommendation describes the functional requirements, features, access and the operational management of the IEPS.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[1] ITU-T Recommendation E.105 (1992), *International telephone service*.

3 Definitions

This Recommendation defines the following term:

3.1 IEPS user: User authorized by a national authority to have access to IEPS. The specific mechanism that a national authority uses to authorize a user is a national matter and is outside the scope of this Recommendation.

4 Abbreviations

This Recommendation uses the following abbreviations:

HPC	High Priority Call
IEPS	International Emergency Preference Scheme for Disaster Relief Operations
ISDN	Integrated Services Digital Network
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
RNMC	Restrictive Network Management Control

5 Overall functional requirements

The primary goal for IEPS is to support crisis management arrangements. IEPS should significantly increase the ability of IEPS users to initiate and complete their communications (voice and data) via the PSTN, ISDN or PLMN irrespective of the bearer technology.

National preference schemes are intended for use in times of national crisis, but there could be occasions when an international preference scheme may need to be enabled while use of the respective national preference scheme would be unnecessary. An example of this is when intense international traffic is generated to a distant country in crisis. Therefore, international and national preference schemes need to be considered as independent and compatible.

IEPS users of a national preference scheme may not be eligible to gain access to the international scheme, but IEPS users of the international scheme should be able to use their own national preference scheme.

It is recognized that in some national systems, IEPS features may be permanently enabled.

IEPS users should be able to use their normal telecommunications equipment in times of crisis. When making an IEPS call, the PSTN/ISDN/PLMN should not appear markedly different to an IEPS user.

Calls originated by IEPS users should be given priority through the networks involved when IEPS is enabled.

Under conditions of severe damage or congestion, countries should be able to effect network controls, particularly over incoming traffic, even though IEPS may have been invoked.

In order to ensure that an IEPS user can reliably call any other telecommunications user, any restrictions to call completion should be overridden. This does not include pre-emption of any existing calls.

Access to public emergency services is not impacted by this Recommendation.

Countries may establish bilateral agreements with regard to the exchange of preference calls and the treatment of such calls.

Both the technical means and the management procedures for the initiation and operation of IEPS should be established and should be compatible with the existing national network traffic management schemes.

This preference scheme is only intended for use by IEPS users to be able to place calls with preference. Public emergency services, on the other hand, are intended for use by members of the general public to request services such as fire, police, and medical. They are often invoked by a short access code.

6 IEPS features

Calls from IEPS users should be suitably marked (see Note 1) at the network entrance and such markings should be associated with the call to completion (i.e., EPS calls should be marked from end to end).

NOTE 1 – Call Marking: A specific identifying mark is associated with the call which prompts operational elements of the public switched network to provide advantages in signalling, switching and traffic routing over non-marked calls. Call marking facilities are available in modern signalling networks and these can be used by the telecommunications providers to allow call completion advantages to preference user's calls.

NOTE 2 – The call marking, marking interpretation and the processing arrangements will have to be specified and fully agreed at the gateway points. Arrangements to transfer the marked signals would also need to be agreed with non-participating intermediate service providers of the transit networks.

The essential network features for the successful operation of IEPS are:

- a) priority dial tone;
- b) priority call setup, including priority queuing schemes; and
- c) exemption from restrictive management controls, such as call gapping.

A list of features that will enhance call completion are mentioned in Annex A.

All IEPS calls will be of the same call class such that there will be only one level of priority for IEPS calls, however, some implementations may provide enhanced service features by analyzing additional signalling information provided by the call initiator. For example, the country of call origination may have a multi-level preference scheme and may make an agreement with the country of call destination for this multi-level preference scheme to be mapped onto that of the country of destination. In such circumstances it is essential that the information relating to level of priority be carried transparently across the international network and presented to the destination network. Transit networks not supporting the IEPS concept should not be required to examine the preference information but should simply pass the signalling information without any change.

Pre-emption in the Public Network (i.e., terminating any existing call) should not be provided.

7 Operational management of the IEPS

Requests for enabling the IEPS should be coordinated between the involved countries. In each country, IEPS will be authorized by the national authority and it will be their responsibility to establish the necessary arrangements.

IEPS users are to be determined by national authorities. Some criteria a national authority may wish to consider for the selection of IEPS users can be found in Appendix I.

To optimize the success of these calls there should be exemption from any restrictive network management controls. There should be preferential access to network resources. These preferential calls might also circumvent terminating user-invoked network features that might prevent alerting such as, for example, do not disturb or call screening.

If a network element is not able to respond to the preferential call request, the routing of the call should not be adversely affected, nor should any preference indicators be removed.

Annex A

Features and techniques to enhance call completion

The features described in this annex may be used separately or in combination to increase the probability of the successful completion of calls, but IEPS is not necessarily dependent on them. The list is not exclusive and the use of these features is to be determined by each country, taking into account the capabilities of the networks being used.

No.	Essential features for IEPS	Feature requires call marking
1	Priority dial tone – wireline or wireless connections (Essential Line service)	No
2	Priority call setup message through signalling network with high priority call identifier (HPC identifier)	Yes
3	Priority indicator in bearer networks	Yes
4	Exemption from restrictive network management controls, such as call gapping (Exemption from RNMC)	Yes

No.	Optional features (F) and techniques (T) to enhance call completion	Feature requires call marking
5	Survivable access and egress from end user location to PSTN/ISDN/PLMN: (F) a) Local exchange bypass; (T) b) Diverse PSTN/ISDN access from cellular; (T) c) Prescription override; (T) d) Avoidance routing; (T) e) Diverse routing. (T)	Yes Yes Yes Yes Yes
6	IEPS user verification (F)	Yes
7	Special announcements on call progress (F)	Yes
8	Special routing capabilities: (F) a) Enhanced alternate routing; (T) b) Trunk queuing; (T) c) Off-hook trunk waiting; (T) d) Dynamic trunk reservation; (T) e) Trunk sub-grouping; (T) f) Automatic call rerouting; (T) g) PSTN/ISDN/PLMN partitioning. (T)	Yes Yes Yes Yes Yes No No
9	Call forwarding (F)	Yes
10	Abbreviated dialling (F)	No
11	Attendant override (F)	Yes
12	Authorization codes (F)	No
13	Automatic call distribution (F)	No
14	Call-by-call service selection (F)	No
15	Call pickup (F)	No
16	Call transfer (F)	No
17	Call waiting (F)	No
18	Calling number identification (F)	No

A.1 Priority dial tone

This is a service arrangement that enhances the ability of IEPS users to receive priority over other users for the reception of dial tone. This is a restrictive treatment of non-IEPS users. Note that access denial systems are an extreme form of restrictive treatment by limiting dial tone to permitted lines only.

A.2 Priority call setup message through national and international signalling network with call identifier

This is a method of marking and identifying IEPS calls. As the IEPS call progresses through the networks, this identifier would enable special routing and preferential treatment to ensure the higher probability of call completion.

A.3 Priority indicator in bearer networks

This is a method of marking and identifying IEPS connection set ups and should cause priority allocation of bearer resources. As the IEPS connection set up progresses through the networks, this

identifier could enable special routing and preferential treatment to ensure the higher probability of connection establishment. The preferential allocation of bearer resources should be maintained throughout the duration of the call.

A.4 Exemption from restrictive management controls

Network management is a set of control measures used to prevent or control degradation of network service. These measures are either expansive or protective. Expansive measures increase call routing choices by providing more capability than normal to carry excess traffic. Protective measures limit calls going into a switch or trunk group. An IEPS call should be exempt from restrictive controls, but should still benefit from expansive controls.

A.5 Survivable access and egress from end user location to PSTN/ISDN/PLMN

Techniques that enhance survivable access from the end user to the PSTN/ISDN/PLMN are described in a to e.

a) Local exchange bypass

The use of direct access services to, or egress services from, Switched Networks by using either bulk, wideband, switched, point-to-point, or circuit-by-circuit services. These services are available from providers such as cellular service providers, specialized service providers and satellite service providers.

b) Diverse PSTN/ISDN access from PLMN

This technique allows PLMNs to directly interconnect with other elements of PSTN/ISDN. This allows PLMN calls to be routed around failed or congested nodes. Network access diversity allows specifically identified calls to be routed to private or special purpose networks.

c) Prescription override

The ability to select an alternative carrier, e.g., by dialling a specific code or operating a selection key on the terminal instrument, or may be automatic for an IEPS call.

d) Avoidance routing

This technique, with limited availability, permits a user to enhance their survivability in PSTN/ISDN by directing the service provider to assign them to transmission facilities that avoid points of vulnerability such as earthquake zones or hurricane areas.

e) Diverse routing

This technique provides the user with a second route over physically separate facilities, which can be used if the primary route is unavailable.

A.6 IEPS user verification

This feature allows for the verification of the IEPS user. Personal Identification Numbers (PINs), line identification, authorization codes or call-back facilities could be used to verify the call as an authorized IEPS call.

A.7 Special announcements on call progress

This feature will provide recorded voice announcements to the user when calls cannot be completed or to provide problem and restoration information.

A.8 Special routing capabilities

Special routing capabilities that enhance call completion are described in a to g.

a) Enhanced alternate routing

Routing programs are used to provide special routing controls and paths within a network.

b) Trunk queuing

This technique would hold the IEPS call in queue until a trunk became available, then the first call in queue (the IEPS call) would have access to the next available trunk. The IEPS call would not receive an immediate "all trunks busy" tone.

c) Off-hook trunk waiting

This technique allows the IEPS caller to remain off-hook and the network continually searches, at predetermined intervals (i.e., several seconds) for an idle trunk if no idle trunk was found on the initial attempt.

d) Dynamic trunk reservation

This technique automatically reserves reservation of trunks for certain classes of calls under designated conditions. It could be implemented or activated in the following ways:

- IEPS calls could be allocated a variable number of trunks between switches according to demand;
- the use of network management control under predetermined conditions, to reserve trunks in an idle condition for the exclusive use of IEPS calls; and
- the designation of specific sub-groups within a trunk group that, under predetermined conditions, would be reserved for IEPS calls.

e) Trunk sub-grouping

This technique splits trunks into pre-assigned sub-groups; one for general use and another for IEPS use only. Under normal conditions, general use traffic could use either sub-group. During emergencies, only IEPS calls would use the IEPS sub-group. Overflow from the IEPS sub-group could be routed over the general use sub-group but the general calls would not be allowed to overflow to the IEPS sub-group.

f) Automatic call rerouting

This technique allows calls to be routed over other operator's networks.

g) PSTN/ISDN/PLMN partitioning

This is the use of hardware or software to separate traffic into specific functional groups for the purpose of providing special service capabilities such as enhanced call completion for IEPS calls.

A.9 Call forwarding

This feature enables calls to be rerouted automatically from one line to another, or to an attendant.

A.10 Abbreviated dialling

A feature by which a user can attempt a call by dialling a two- or three-digit code that instructs a database to obtain the actual desired number from a look-up table and transmit it into the network to connect the calling line to the called line.

A.11 Attendant override

A feature that allows the terminal equipment operator to interrupt a call that is in progress.

A.12 Authorization codes

Unique multi-digit codes used to allow an IEPS user privileged access to a network, system or device. If the code is validated the call is allowed to advance.

A.13 Automatic call distribution

A system designed to evenly distribute traffic by directing incoming calls over a group of terminals.

A.14 Call-by-call service selection

A feature that provides improved trunking efficiency between end-user location and end-office by allowing a variety of services to use the same trunk group and by distributing traffic over the total number of available trunks on a call-by-call basis.

A.15 Call pickup

This feature enables a connected extension to answer any ringing extension within an assigned call pickup group.

A.16 Call transfer

A feature whereby a call to a user's number is automatically transferred to one or more alternative numbers when the called number is busy or does not answer.

A.17 Call waiting

A feature that provides a distinctive audible tone to a busy user's line to notify the user when another caller is attempting to reach his/her number.

A.18 Calling number identification

A feature that provides the identification of the calling user's number by means of a visual or audible identification at the called terminal.

Appendix I

Criteria for the selection of IEPS users

IEPS users are to be determined by their national authorities. The criteria for selection that a national authority may wish to consider are listed as, but are not limited to, the following items:

- civil defense/"home defense", e.g., public warning systems;
- diplomatic and other vital governmental purposes;
- state security purposes including customs and immigration;
- emergency services by local authorities, including police, fire services, etc.;
- posts and telecommunications service providers, for maintaining their service provision to other essential users;
- public utilities including energy, water supplies, etc.;
- medical services;
- air and sea rescue.

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