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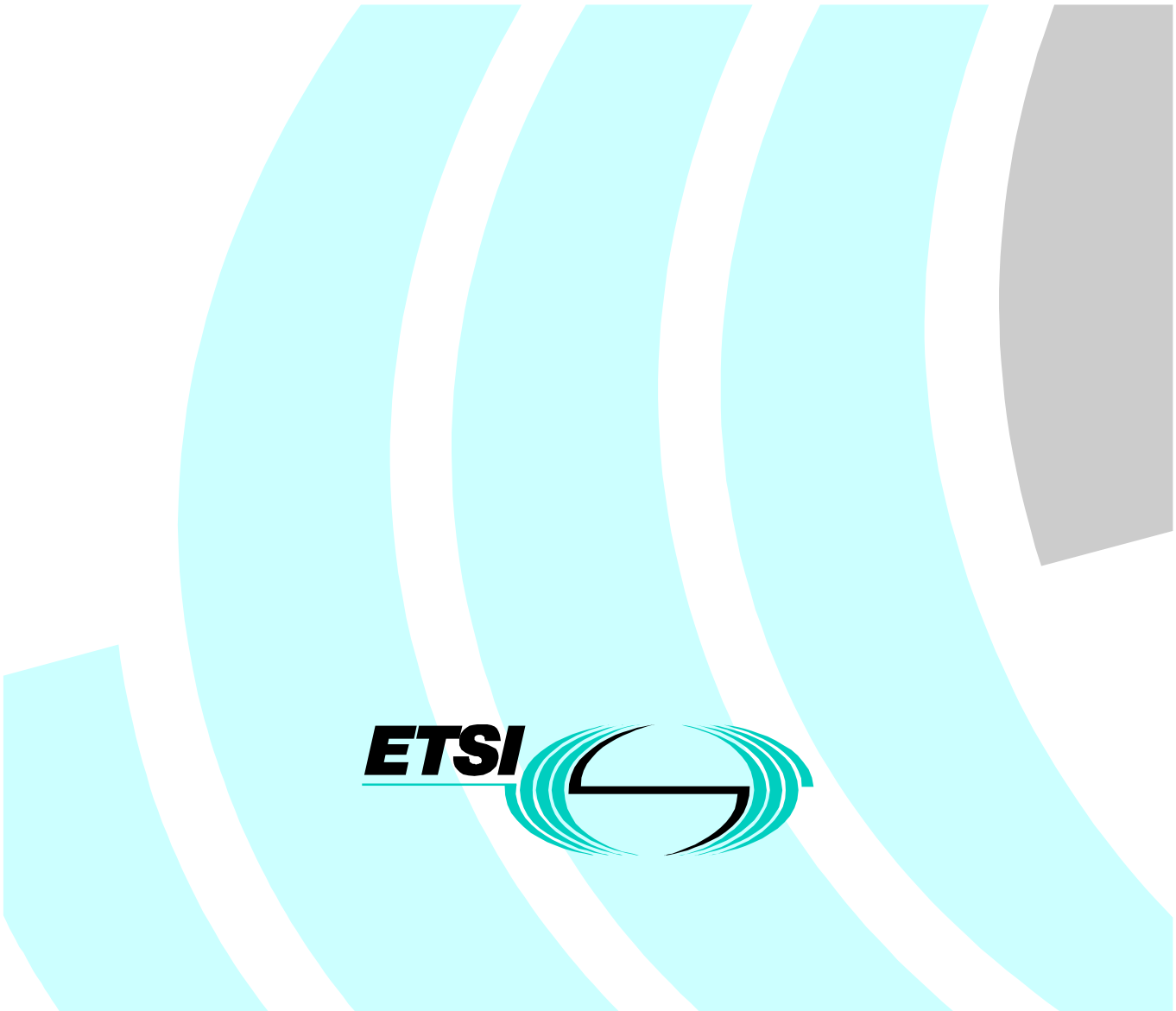
Technical Report

Human Factors (HF); Supplementary service codes for use in public network services



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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Human Factors (HF).

The intended users of the present document include:

Intended users and potential benefits

	User	TR used for	Potential Benefit
1	Service providers and designers	Development of user control procedures for supplementary services	Improved usability through harmonized procedures
2	Terminal designers	To provide a source of information on supplementary service codes	
3	Network operators	Specification of user control procedures for supplementary services	Increased use of supplementary services through improved usability
4	ETSI Technical Bodies	To assist with the development of new standards	Improved usability of services by ensuring harmonized procedures

Introduction

ETSI has the responsibility for registration and allocation of service codes for supplementary services used in public network services. The responsibility was transferred from ETNO/CEPT in 1995. At its 24th meeting the ETSI Technical Assembly assigned this responsibility to its Technical Committee Human Factors(TC-HF) following the work done to create ETS 300 738 [11] and to harmonize the codes used by both GSM and TETRA.

An official ETSI register of allocated service codes is now required. It should be approved by the ETSI membership and then be maintained. As the code listings are extremely congested and previous research reported in ETR 261-6 [10] suggested a significant under utilization of assigned codes, TC-HF's first action was to complete a detailed survey to establish current service code usage across the public networks by means of a questionnaire which was circulated with a deadline for returns by 31st December 1997.

An ETSI Specialist Task Force (STF 117) analysed the answers to this questionnaire and provided the means for TC-HF to set up the register of supplementary service codes. The resulting register is intended to be published regularly updated by ETSI.

The ETSI Secretariat should take over maintenance of the register and make the service codes available on the ETSI Web site, together with the contact point within TC-HF for enquiries and applications for the allocation of codes for new services.

1 Scope

The present document describes the use of service codes for supplementary services used in public network services. It was based upon the analysis of the answers to a questionnaire sent out to the whole ETSI members. In October 1997, it was supplemented by follow up questioning and the consideration of relevant ETSI, GSM, CEPT, TETRA and ITU-T documents.

The present document describes the creation of a register of supplementary service codes together with a database to facilitate the entry of the necessary base information. The register does not include supplementary services used in PBX or Centrex based services.

A separate ETSI Standard ES 201 382 [9] describes the application and registration procedures for a service provider wishing to enter a new supplementary service in the ETSI register.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] 90/387/EEC (June 1990): "Council Directive of 28 June 1990 on the establishment of the internal market for telecommunications services through the implementation of open network provision".

[2] 92/383/EEC (June 1992): "Council recommendation of 5 June 1992 on the provision of harmonized integrated services digital network (ISDN) access arrangements and a minimum set of ISDN offerings in accordance with open network provision (ONP) principles".

[3] 95/62/EC (December 1995): "Directive 95/62/EC of the European parliament and of the Council of 13 December 1995 on the application of open network provision (ONP) to voice telephony".

[4] CEPT "Handbook on services and facilities offered to the subscribers in modern telephone systems" Sections I and II "Services and Facilities within the Public Network" 3rd Edition 1981 (with later amendments).

[5] CEPT Recommendation T/CAC 02 E (June 1992): "Subscriber control procedures for supplementary services in modern telecommunication system".

[6] CEPT Recommendation T/CAC S 10 E (November 1992): "Service and facilities aspects of an Integrated Services Digital Network (ISDN)".

[7] CEPT Recommendation T/CAC S 10.5 E (November 1992): "General supplementary service aspects of an Integrated Services Digital Network (ISDN)".

[8] CEPT Recommendation T/CAC S 10.7 E (November 1992): "Operational requirements of ISDN supplementary services".

[9] ES 201 382: "Human Factors; Procedure for registering a supplementary service code".

[10] ETR 261-6 (1996): "Human Factors (HF); Assessment and definition of a harmonised minimum man-machine interface (MMI) for accessing and controlling public network based supplementary services; Part 6: Survey of existing PSTN, ISDN, mobile networks, and a user survey of supplementary service use within Centrex and PBX environments".

[11] ETS 300 738 (1997): "Human Factors (HF); Minimum Man-Machine Interface (MMI) to public network based supplementary services".

[12] ETS 300 952 (1997): "Digital cellular telecommunications system; Call Forwarding (CF) supplementary services; Stage 3 (GSM 04.82 version 5.0.1)".

[13] GTS GSM 02.67 (1996): "Digital cellular telecommunications system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 1 (GSM 02.67)".

[14] GTS GSM 02.72 (1996): "Digital cellular telecommunications system (Phase 2+); Call Deflection; Service description, Stage 1 (GSM 02.72)".

[15] GTS GSM 02.81 (1996): "Digital cellular telecommunications system; Line identification supplementary services; Stage 1 (GSM 02.81)".

[16] GTS GSM 02.82 (1995): "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services; Stage 1 (GSM 02.82)".

[17] GTS GSM 02.83 (1996): "Digital cellular telecommunications system; Call Waiting (CW) and Call Holding (HOLD) supplementary services; Stage 1 (GSM 02.83)".

[18] GTS GSM 02.84 (1996): "Digital cellular telecommunications system; MultiParty (MPTY) supplementary services; Stage 1 (GSM 02.84)".

[19] GTS GSM 02.85 (1996): "Digital cellular telecommunications system; Closed User Group (CUG) supplementary services; Stage 1 (GSM 02.85)".

[20] GTS GSM 02.86 (1996): "Digital cellular telecommunications system; Advice of Charge (AoC) supplementary services; Stage 1 (GSM 02.86)".

[21] GTS GSM 02.87 (1997): "Digital cellular telecommunications system (Phase 2+); User-to-User Signalling (UUS); Service description, Stage 1 (GSM 02.87 version 5.2.1)".

[22] GTS GSM 02.88 (1996): "Digital cellular telecommunications system; Call Barring (CB) supplementary services; Stage 1 (GSM 02.88)".

[23] GTS GSM 02.90 (1997): "Digital cellular telecommunications system; Unstructured Supplementary Service Data (USSD); Stage 1 (GSM 02.90)".

[24] GTS GSM 02.93 (1997): "Digital cellular telecommunications system (Phase 2+); Completion of Calls to Busy Subscriber (CCBS); Service description, Stage 1 (GSM 02.93 version 5.4.0)".

[25] GTS GSM 02.95 (1996): "Digital cellular telecommunications system (Phase 2+); Support of Private Numbering Plan (SPNP); Service description, Stage 1 (GSM 02.95)".

[26] ITU-T Recommendation I.250 (1988): "Definition of supplementary services".

[27] ITU-T Recommendation I.251: "Number identification supplementary services".

[28] ITU-T Recommendation I.252: "Call offering supplementary services".

[29] ITU-T Recommendation I.253: "Call completion supplementary services".

[30] ITU-T Recommendation I.254: "Multiparty supplementary services".

[31] ITU-T Recommendation I.255-3 (1988): "Community of interest supplementary services: Support of Private Numbering Plans".

[32] ITU-T Recommendation I.256 (1988): "Charging supplementary services".

[33] ITU-T Recommendation I.257-1 (1995): "User-to-user signalling".

[34] T/SF 31 (January 1988): "Services and facilities aspects of Integrated Services Digital Network (ISDN)".

[35] T/SF 53 (January 1988): "Remote control of supplementary Services".

[36] T/SF 55 (January 1988): "Supplementary services available to subscriber complex installations connected to an Integrated Services Digital Network (ISDN)".

[37] T/SF 66 (July 1990) "Services and facilities aspects of Digital European Cordless Telecommunications (DECT)".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply:

Service Code: A two or three digit string used within a user command dialogue to identify a Supplementary Service.

Supplementary Service: An additional service provided by a network which modifies or supplements a basic telecommunications service or services.

switching order: An instruction sent by the user to the exchange during a condition different from the normal call set up conditions to perform a function relating to a Supplementary Service.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

*	The Star on the standard telephone keypad array
#	The Square on the standard telephone keypad array

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CAC	Commercial Action Committee (within CEPT)
CEPT	Conférence des Administrations Européennes des Postes et Télécommunications
ETNO	Association of Public Telecommunications Network Operators
GSM	Global System for Mobile communications
IMEI	International Mobile station Identity
ISDN	Integrated Services Digital Network
ITU-T	ITU-Telecommunication Standardization Sector
NA	Network Aspects (ETSI TC)
ONP	Open Network Provision
PSTN	Public Switched Telephone Network
PX	Prefix
SC	Service Code
SF	Services and Facilities (within CEPT)
SI	Supplementary Information
SMG	Special Mobile Group (ETSI Technical Body)
SR	Separator
SS	Supplementary Service
STF	Specialist Task Force (within ETSI)
SX	Suffix
TB	Technical Body
TETRA	Terrestrial Trunked RAdio

4 Basis of the work

4.1 Terms of reference of ETSI STF 117

The original terms of reference required the STF to:

- collate and analyse the data from the questionnaires;
- categorize and rationalize the existing service code listings (to free up non-used codes and open up new service code groupings);
- create the draft register and prepare the documentation for approval by TC-HF in March 1998.

The tasks were later amended to include the generation of definitions for the Supplementary Services and the creation of the register in an electronic form, viz.:

- collate and analyse the data from the questionnaires;
- define, categorize and rationalize the existing service code listings (to free up non-used codes and open up new service code groupings);
- create an electronic draft Register in a form suitable for maintenance by the ETSI Secretariat.

In addition, an ETSI Standard ES 201 382 [9] was to be prepared setting out the procedures for registering a new supplementary service and the allocation of its code.

4.2 Supplementary Service (SS) code

4.2.1 Use of a SS code

A supplementary service code is a two or three digit string used within a user command dialogue used to gain access to and control of a supplementary service. Its use is specified in ETS 300 738 [11] and should contain the following fields:

- prefix (**PX**), a mandatory element;
- service code (**SC**), a mandatory element;
- separator(s) (**SR**), as required;
- supplementary information (**SI**) one or more units as required;
- suffix (**SX**), a service suffix as required.

The dialogue thus has the following syntax: **PX SC (SR SI) SX**.

Each unit of supplementary information is preceded by a separator and more than one unit of supplementary information may be included.

Thus a typical dialogue could be:

* 67 * 360036# which would forward calls to number 360036 when the served user was busy.

The dialogue can be sent by a process of overlap or "en-bloc" dialling. In the case of overlap sending the dialogue is preceded by a start command which is normally an "off-hook" procedure. Where the service code needs to be invoked during a call, the start command may be a "register recall" signal.

In the case of en-bloc dialling, a finish command is used to request the transmission of the dialogue which is normally an "off-hook" procedure or a "send" signal.

Further sets of supplementary information can follow the basic dialogue, one after another divided by separators.

4.2.2 Switching orders

A switching order is an instruction sent by the user to the exchange during a condition different from the normal call set up conditions in order to perform a call control function relating to particular SSs.

The syntax is typically (**R**) **SO**.

Where "R" is the Register recall signal and SO is the Switching Order, although it is recommended that "R" should only be used where there is a specific technical need for it.

The dialogue can be sent by a process of overlap or en-bloc dialling as described in 4.2 above.

4.3 Questionnaire

The questionnaire, which had been created previously by TC-HF, was sent out to the whole ETSI membership asking for a reply before the 31st December 1997. It asked for the name and address of a contact point in the responding organization and listed 25 common SSs for PSTN, ISDN, analogue and digital mobile networks inviting the respondent to fill in the service code against the relevant SS. It also invited information on any other SSs that might be supported.

The listed services were:

- Advice of charge, Call Set-up; Advice of charge, During Call; Advice of charge, End of Call;
- Call Barring, Incoming Calls; Call Barring, Outgoing Calls; Call Deflection; Call Forwarding Busy;
- Call Forwarding No Reply; Call Forwarding Unconditional; Call Hold; Calling Line Identification Presentation;
- Calling Line Identification Restriction; Call Waiting; Call Transfer, Explicit; Closed User group;
- Completion of Call to Busy Subscriber; Conference Call, 3 Party;: Conference Call, Add On;
- Conference Call, Meet Me; Connected Line Identification Presentation;
- Connected Line Identification Restriction; Malicious Call Identification; Sub Addressing; Terminal Portability; User User Signalling.

13 other SSs were listed in a part of the questionnaire, which dealt with analogue and digital trunked mobile networks. These were:

- Area Selection; Late Entry; Access Priority; Pre-Emptive Priority Call Level 1:
    - Pre-Emptive Priority Call Level 2; Pre-Emptive Priority Call Level 3; Pre-Emptive Priority Call Level 4 – 9; Listening; Ambience Listening; Discreet Listening; Dynamic Group Assignment:
        - Call Authorized By Dispatcher; Over the Air Re-keying.

The questionnaire also included information on existing code allocations and gave references to standards and other documents that specified the codes.

5 Analysis of questionnaire

5.1 Number of responses

When the work of analysis commenced there were 14 replies available from BT (UK), Belgacom, Cyprus Telecommunications Authority, France Telecom, Mannesman Mobilfunk, Mobiltel, Netia Telecom SA, Polska Telefonia Cyfrowa, Portugal Telecom, Telecel, Telecommunications Administration Centre Finland, Telia, TMN (Portugal) and Türk Telecom. Two more were later received, from CELLNET and the Hungarian Regulatory Authority.

These sixteen responses were so few as to make it difficult to assume that any codes not reported are not actually in use. On the other hand, the number of "other services" reported as being offered which were not in the original questionnaire were so many as to create significant problems in the data analysis. Compared to the total of 38 services listed in the original questionnaire, the relatively few answers received listed 175 services said to be in use or intended to be used.

5.2 Anomalies

A number of replies were somewhat anomalous. Some respondents claimed that SSs were to be introduced shortly but gave no Code. Others gave titles that were not clear (e.g. Call Pick-up without barge-in), with or without a Code. One Country claimed it currently or would soon offer all possible SSs on ISDN but reserved the information on all Codes. The same country claimed GSM SSs "cf. ETSI ETS".

Many such replies required further query back to the contact name given in order to seek clarification of the service referred to, its definition and the reason for the choice of a particular code. To confirm the STF 117 interpretation of the answers, a listing of the claimed codes was sent to respondents to the questionnaire asking for confirmation that the replies had been correctly interpreted. This listing was accompanied by the SS definitions.

The iterative tasks involved in handling these repeated queries and in generating service definitions has meant that some final confirmatory replies are still outstanding at the time of completion of the draft report. Any changes arising from this final round of queries should be able to be dealt with by the 19th TC-HF meeting in September 1998.

5.3 Data entry

A database has been created in Microsoft Access© (Version 2) which allows the information contained in the responses to the questionnaire to be input into four Access© forms:

- the first contains the name and address information supplied in the answers to the questionnaire;
- the second the Network Type;
- the third the SS title together with its abbreviation, definition and the source information; and
- the final form, which gave access to the other three, served for entry of the Service Code.

These forms will be useable by the ETSI Secretariat for data entry in any further application for SS codes.

The resultant database permitted the manipulation of the data in a number of ways to enable it to be analysed and listed according to various criteria.

The database potentially forms the basis for an interactive web page containing the ETSI register of SS codes.

5.4 Definitions

In order to be able to clarify anomalies in the answers to the questionnaire it was necessary to have a clear understanding of the SS referred to; i.e. the service had to be defined. This definition needed to be unambiguous, and worded in user related terms. For this reason it was decided that each such service in the ETSI Register database should be allotted a unique definition. It should be noted that there is a distinction between definition of a service and a service description. The former should be a simple explanation of what the service is intended to do, while the latter is a more detailed description of the way the service operates under different telecommunications environments and necessarily includes some technical explanation.

The definitions, which are provided in annex A, are intended for inclusion in the Register, and have been derived from a number of sources, modified in some cases by the re-query process. Main source references are appended to each definition.

The main reference sources are the CEPT Handbook on services and facilities within the public network (the CEPT SF Handbook [4]), the CEPT document on the operational requirements of ISDN SSs (Recommendation T/CAC S 10.7 [8]), ITU-T Recommendation I.250 [26]) and ETSI Standards which in some cases are synonymous with the GSM or TETRA published standards.

In the majority of cases, the CEPT SF Handbook [[4]] has provided the clear definition of a service. In some cases, Recommendation T/CAC S 10.7 [8] has simplified the definition, and in a few the ITU-T definition has been used as being the simplest explanation of a service's intended use. Most ETSI standards echo one of these prime sources.

In the case of new services, that is ones for which no definition could be found, and for which no service code had been assigned, a new definition has been composed and in these cases the wording has been chosen to be compatible with other definitions.

The original CEPT SF Handbook [4] appeared to try and define as many services as could be envisaged at that time (1981), when public switching exchanges were only beginning to change over to all electronic, processor controlled systems. The CEPT Committee went on to develop the concept of families of services, and whilst some of these were fully expanded, others remained at a simple stage of development until CEPT was disbanded.

6 Categorization and rationalization

6.1 Naming variations

Categorization of SSs was complicated by variations in the names given to the services and their categories in the documents referenced during the study. One of the areas in which the greatest variation of naming exists in the reference documents is that of services that result in a call intended for delivery to one telephone number being forwarded to another telephone number.

T/CAC S 10.7 [8] describes the class of services as "Diversion Services" but then describes most of the individual service as "Call Forwarding …". The list of services given in T/CAC 02 E [5] prefaces the names of some of the services as "Absent Subscriber, …" and uses the word "Diversion" in the many of its descriptions and "Call Forwarding" in most of the remainder.

The SF Handbook [4] categorizes many of the relevant services as "Absent Subscriber Services". It appends "Immediate Diversion" to services that forward calls unconditionally and "Diversion on No Reply" to services that forward calls that meet a no reply condition. The SF Handbook [4] assigns calls that are forwarded on meeting a busy condition to a "Call Completion" category with a "Diversion on Busy" sub-category.

SSs where only calls originating from a small set of numbers are forwarded, or all calls except for those originating from a small set of numbers are forwarded, are assigned to the "Do Not Disturb Services" category and further assigned to "Selective Diversion" sub-category.

The SF Handbook [4] reserves the title "Call Forwarding" to apply to a very specific pair of services:

- Call Forwarding Service, Administration Controlled - in which calls to an administration allocated number in a distant area are forwarded to the subscriber's own number;
- Call Forwarding, Subscriber Controlled - as above, but with the subscriber able to change their registered "own number".

Whereas all the other services are expressed in terms of calls offered to the subscribers own number being diverted to some other number, these services apply to calls offered to a specially obtained remote number being diverted to the subscriber's normal office/home number. To clarify this potential confusion it is necessary to distinguish this unique characteristic in the titling and description of the services without exclusively reserving a commonly accepted term such as "call forwarding" for them.

In order to clarify the significant confusion arising from the terms used, a decision was taken to adopt the term "Call Offering Services" (as used in ITU-T Recommendation I.250 [26]) to describe the set of all services that result in a call intended for delivery to one telephone number being forwarded to another telephone. As well as minimizing the number of confusions due to different interpretations of the same words, this decision also follows ETSI practice of adopting International Standards where they exist.

It was decided to drop reference to the comparatively redundant term "Absent Subscriber" used in the categorization and naming of the SF Handbook [4] and T/CAC 02 E [5]. The recent ETSI GSM standards, including ETS 300 952 [12], and also ITU-T Recommendation I.250 [26] use "Call Forwarding" in the names of many of the individual services and hence this term has been used in preference to the less frequently used (within ETSI) term "Diversion".

6.2 Existing categorizations

A comprehensive categorization of SSs is provided in Section II of the SF Handbook [4]. The large number of categories (14) and the even larger number of sub-categories within the SF Handbook [4] means that each sub-category is likely to have few if any members. The resulting (semi-) redundant categories are a potential source of confusion to those using a register based upon these categories. In addition, the SF Handbook [4] still manages to have a very large "Miscellaneous" category, which rather undermines the values of having a categorization.

The amended CEPT Recommendation T/CAC S 10 E [6] also categorizes SSs in Recommendation T/CAC S 10.5 [7] and expands on their description in Recommendation T/CAC S 10.7 [8]. The present document also suffers from the same problem of a rather large number of categories (19) that contain few if any SSs in use in the public network.

Most of the more useful categories in T/CAC S 10.5 [7] have been adopted, subject to minor renaming, by other later documents in the ITU and in ETSI. T/CAC 02 [5] gives a comprehensive listing of SS codes but provides no categorization or explanatory description of the services.

ITU-T Recommendation I.250 [26] gives definitions of the basic ISDN SSs and categorizes them in terms of the titles of the recommendations which describe major groups of SSs. ETSI's GSM specifications adopt the same approach. Both these documents identify the following categories:

- Number Identification SSs (ITU-T Recommendation I.251 [27]) (GTS GSM 02.81 [15]);
- Call Offering SSs (ITU-T Recommendation I.252 [28]) (GTS GSM 02.82 [16]);
- Call Completion SSs (ITU-T Recommendation I.253 [29]) (GTS GSM 02.83 [17]);
- Multiparty SSs (ITU-T Recommendation I.254 [30]) (GTS GSM 02.84 [18]);
- Community of Interest SSs (ITU-T Recommendation I.255-3 [31]) (GTS GSM 02.85 [19]);
- Charging SSs (ITU-T Recommendation I.256 [32]) (GTS GSM 02.86 [20]).

In addition ETSI's GSM specifications add the following categories:

- enhanced Multi-Level Precedence and Pre-emption (eMLPP) (GTS GSM 02.67 [13]);
- Call Deflection SSs (GTS GSM 02.72 [14]);
- Call Restriction SSs (GTS GSM 02.88 [22]);
- Call Transfer SSs (GTS GSM 02.90 [23]);
- Support of Private Numbering Plan SSs (GTS GSM 02.95 [25]).

6.3 Adopted categorization

The adopted categorization has been based upon those categories shared between ITU-T Recommendation I.250 [26] and the ETSI GSM listed above. The "Call Restriction" category identified in ETSI's GSM standards has been included as its members have unique characteristics and it has a large number of members.

"Call Deflection" and "Call Transfer" SSs have been merged into the "Call Offering" category rather than being separate categories of their own as is the case in the ETSI GSM standards and some other sources. This was done for two reasons:

1) Both of these groups of SSs result in calls intended for one subscriber being offered to another subscriber (or to some form of automated announcement). They differ from other "Call Offering" services in that it is the user that controls the offering of the call rather than being automatically offered as a result of pre-set conditions being met.

2) Neither of these groups of SSs contains enough variants to justify assigning a category group to them.

The category "User-to-User SSs" has been retained as a category. Although the current questionnaire responses have only identified usage of a generic user-to-user signalling capability, the ETSI GSM standards define four other SSs in this category. It would appear very premature to suggest that these defined services are and will remain unused and hence it makes sense to retain a category devoted to them.

It was not felt necessary to create a category for those SSs listed in reference documents that have not appeared in the questionnaire responses. It has been a major assumption behind the work of STF117 that any service defined as long ago as 1970 that has not yet been used can have its code reassigned.

A completely new category "Automated Calling SSs" has been invented to group together those SSs that relate to the activation and control of the mechanism for delivering alarm calls to a subscriber or for delivering an emergency call from a subscriber.

The remaining SSs share too few characteristics with members of any other category to be assigned to one. In addition, too few of these remaining SSs share common characteristics with each other to justify the creation of a new category. They have therefore all been grouped together in a "Miscellaneous SSs" category.

The resulting sets of categories are:

- Automated Calling SSs;
- Call Completion SSs;
- Call Offering SSs;
- Call Restriction SSs;
- Charging SSs;
- Miscellaneous SSs;
- Multi Party SSs;
- Number Identification SSs;
- User-to-User SSs.

6.4 Categorized listing

The SSs that have been identified in the analysis of the questionnaires obtained so far or in ETSI standards and reports have been fitted into the categorization defined in subclause 6.2 and are listed in table 1. The naming used in the table uses where possible the standard name for the service, modified slightly to bring the primary function of the SS to the beginning of the description. The codes listed in the "ETSI Code" column are the codes derived from those that the various respondents quoted against the relevant SS or those listed in ETSI standards and reports.

The names for SSs that are used in the present document are recommended as the standard names that should be used in technical documents used within the telecommunications and standardization fields. It is not expected that all the providers of SSs will use these names when describing these SSs to their service users. It is, however, recommended that these names are mentioned in information describing SSs in order that those familiar with the naming recommended in the present document can recognize a SS wherever they see it described.

The SSs listed do not include SSs used in PBX or Centrex based services. Nevertheless it is recommended that designers of such SSs wherever possible use the same codes as are used in public network services.

It is recognized that a number of service suppliers have implemented SS packages that are more advanced than those presented in the present document (e.g. BT's CallMinder SS). The present document does not attempt to provide definitions of these enhanced SSs. Furthermore, the present document does not attempt to specify standardized codes for such enhanced SSs. However, it is recommended that the following basic rules are adhered to in allocating codes for enhanced SSs:

1) If a user is able to control the basic features of the SS using codes and user control procedures that correspond to a SS specified in the present document then the code specified in the present document should be used;

2) If the features and control procedures do not closely correspond to a SS specified in the present document then a code or method of control that differs from any specified in the present document should be chosen.

Table 1: Categorized listing

Category	Harmonized Title	ETSI Code
Automated Calling	Alarm call (casual)	55
	Alarm Call Regular, Number of days	56
	Alarm Call Programme	57
	Alarm Warning	87, 88
Call Completion	Abbreviated dialling, Packet selection	50
	Abbreviated dialling, registration	51
	Access Priority	74
	Automatic Personal Call	73
	Call Hold	94, SO 2
	Call Return	92
	Call Waiting	43, SO 0,1,2,3,4
	Completion of Calls on No Reply	16 (Pt)
	Completion of Calls to Busy Subscriber	37
	Dynamic Group Number Assignment	85
	Enhanced Multi-Level Precedence and Pre-emption	75, 75n
	Fixed destination call	53
	Fixed Destination call-timed	53
	Last Number repetition	52
	Line Hunting, Inhibit, Reduce	47
	Paging Call Pickup	82
	Pre-emptive Priority Call, "Emergency"	750
	Pre-emptive Priority Call, Level 1	751
	Pre-emptive Priority Call, Level 2	752
	Priority Call	75
	Priority Call, Levels 3-9	753-759
	Private Numbering Plan, Support of	07n
	Queue Service	38
Call Offering	Absent (Subscriber, Date, Time Tel Number)	20
	Call Deflection	66
	Call Forwarding, All services	002
	Call Forwarding Busy	67
	Call Forwarding Busy, One of a Group	68
	Call Forwarding Conditional	12 (Pt)
	Call Forwarding Conditional, All services	004
	Call Forwarding No reply	61
	Call Forwarding No reply One of a Group	62
	Call Forwarding No reply to Dictated Announcement	64
	Call Forwarding, Not Reachable	62
	Call Forwarding, Selective, Registration	210
	Call Forwarding, Selective up to 10 numbers	211
	Call Forwarding, Selective all but 10 numbers	212
	Call Forwarding Unconditional to any number	21
	Call Forwarding Unconditional to Announcement	24
	Call Forwarding Unconditional to Dictated Announcement	29
	Call Forwarding Unconditional to fixed number	22
	Call Forwarding Unconditional to operator	23
	Call Transfer, Explicit	96
	Do not disturb announcement	26
	Do not disturb in hunt group	49
	(continued)	

Table 1 (concluded): Categorized listing

Category	Harmonized Title	ETSI Code
Call Restriction	Area Selection	48
	Barring, all services	330
	Barring, of Incoming Calls when Roaming outside home PLMN	351
	Barring, of Outgoing International calls	331
	Barring, of Outgoing International calls except to Home Country	332
	Barring, Incoming calls	35
	Barring, Incoming call, all services	353
	Barring, Outgoing calls	33
	Barring, Outgoing call, all services	333
	Barring, Outgoing calls, Subscriber selected	34
	Barring, Selective, Incoming Calls	93
	Barring, Selective, Incoming Calls, up to 10 numbers barred	931
	Barring, Selective, Incoming Calls, all but 10 numbers barred	932
	Barring, Selective, Outgoing Calls, up to 10 numbers barred	18 (Pt)
	Call authorized by dispatcher	86
	Call Rejection, no CLIP	15 (Pt)
	Closed User Group	01
Charging	Account card calling	15 (SF)
	Advice of charge, Call set-up	461
	Advice of charge, During call, cumulative	462
	Advice of charge, During call, incremental	463
	Advice of charge, End of call	464
	Charge limitation by charge units	17 (Pt)
	Home Meter	45
	Reverse Charging	83
Miscellaneous	Ambience Listening	841
	Carrier Selection	09
	Discreet Listening	842
	General deactivation	001
	Listening	84
	Multiple Subscriber Profile	59n
	Password Registration	03
	Personal Identification Number (PIN) Registration	04
	Personal Identification Number 2 (PIN2) Registration	042
	Personal Identification Number (PIN) Unblock	05
	Personal Identification Number 2 (PIN2) Unblock	052
	Terminal Portability	79
	Unstructured Supplementary Service Data (HPLMN)	1X(Y)
	Unstructured Supplementary Service Data (VPLMN)	1X(Y)
Multi Party	Conference call, 3-party	95
	Conference call, Add on	71
	Conference call, Meet me	72
	Late Entry	65
	Multi Party Call	SO 1x, 2x, 3, 4
Number Identification	Calling Line Identification Presentation	30
	Calling Line Identification Presentation on Call Waiting	43 SO 1,2
	Calling Line Identification Restriction	31
	Calling Line Identification Restriction, Per call	31
	Connected Line Identification Presentation	76
	Connected Line Identification Restriction	77
	Distinctive Ringing	91
	Malicious Call Identification	39
	Presentation of IMEI	06
	Sub Addressing	89
User-to-User	User to User Signalling	36
	User to User Signalling all Services	360
	User to User Signalling, Service 1	361
	User to User Signalling, Service 2	362
	User to User Signalling, Service 3	363

6.5 Rationalization of SSs

As the data was collected and analysed it became clear that were some conflicts and difficulties.

Part of the objective of the work was to "rationalize" the SS coding. The analysis of the questionnaire replies showed that one potential form of rationalization that proved to be impossible was to reassign a few unused codes and create a rational assignment of codes such that the codes for all related services had related numbering. The current assignment of codes for services that are in common use already use radically different numbering and there was no scope for reassigning any of these numbers.

In order to fulfil the aim to free up unused codes it was decided not to include in the register those services which had been indicated were going to be used but for which codes had not been allocated. It was also decided not to include old CEPT services and codes which did not appear in any reply.

It was however decided to include the services and codes listed in ETSI GSM and TETRA standards even though not all had appeared in questionnaire answers. Some services are of doubtful status e.g. the service entitled "listening" in TETRA, for which a code had been reserved but no service subsequently proposed.

Some respondents had listed SSs and codes used on their Centrex services, some of which differed from the codes used in their public services. The possibility of listing Centrex as another network was considered but as the original questionnaire referred to services in public networks it was decided to leave such Centrex based services out of the register.

What should have been feasible if sufficient questionnaire responses had been obtained and analysed was:

- to identify which, if any, SSs that have been assigned codes in the CEPT register are not in use and to declare the codes for these SSs available for reallocation to other SSs;
- to identify groups of numbers for each category of SS that could best be used to satisfy new code allocation requests;
- to identify codes that, although in use, had been allocated by one or more administration to services that already have defined and commonly used codes assigned to them. These codes could still have been declared available for assignment to new SSs.

Unfortunately none of these actions could be taken due to the low number of the replies which made it impossible to declare that any particular SSs or codes were not in use.

7 ETSI register for SS codes

7.1 Need for a register

The original ETSI STF 117 terms of reference pointed out that, with agreement from CEPT and ETNO, ETSI has a requirement to create an official register of service codes for public network based SSs. They required the analysis of the data from the questionnaires, the creation of a draft register and the preparation of the documentation for approval by ETSI TC-HF.

Early in the work it was agreed that definitions of each SS would be required in order to resolve ambiguities in the answers contained in the questionnaire and this extra task was written into an amendment to the terms of references.

The maintenance of the list of service codes (which constitute the register) was previously an activity within CEPT and so it appears that the ETSI register was intended to replace the original CEPT register.

The set of old CEPT documents which contain the information forming the CEPT register of SS codes was never fully completed and even so runs to some 1 500 pages! It was an early conclusion of STF 117 that such a task would be beyond the capabilities of TC-HF voluntary work.

The construction of a register fully equivalent to the CEPT documentation would require the full engagement of an ETSI Technical Body (TB) formed jointly from a number of ETSI TBs including at least NA, SMG, TETRA and HF.

Such a level of activity is at present unlikely to be supported by the ETSI membership and it was therefore necessary to consider a different form and content for the ETSI register.

7.2 CEPT register

The old CEPT register was a listing of SS titles and codes of which the latest version appears to be contained in CEPT Recommendation T/CAC 02 [5]. This was supported by and dependent upon the CEPT Handbook [4] together with Recommendations T/CAC S 10 E [6], T/SF 31 [34], T/SF 53 [35], T/SF 55 [36] and T/SF 66 [37]. The register did not treat any SSs used in GSM and TETRA.

The supporting documents gave a vast amount of information on each SS and demonstrated that much cross checking had been undertaken of each service and its potential impact on other services.

For each SS a definition was provided together with a general description of the service as seen by the user i.e. not a technical description. The user was defined in the documentation, as was the call state in which the service was used and the telecommunications services to which the service was applicable. The methods for users to access the service were described, as were the stimulus mode procedures. Details were given of information provided to the user in case of an unsuccessful outcome.

Interworking and intercommunication with other networks (including private networks) was treated and details were given of what should happen in the case of simultaneous use of two or more SSs and of the influences on the functions, e.g. which service takes precedence, if two services are in use at the same time.

Commercial considerations were dealt with, setting out the customer categories to which the service should be most useful. Charging matters were treated and any measurable parameters that could be used to express the customer's satisfaction with the service were described.

An example of typical CEPT information on a single SS taken from T/CAC S 10.7 E [8] is given in annex C.

T/CAC 02 E [5] contains an annex giving the allocation of switching orders. This is reproduced as annex B.

7.3 ETSI register

Having noted the format and content of the CEPT documentation it was necessary to consider what should be the content of the ETSI register.

It was agreed by TC-HF that the register itself need be nothing more than a simple listing of the SS titles together with the allocated service code and/or switching order. This would be similar to the information contained in T/CAC 02 [5]. In addition it would be necessary to give an indication of the status of the Service Code showing at least whether it was provisional or approved. A brief description of the service would be needed, sufficient to distinguish it from others. It was considered useful to provide a reference to any ETSI or other source standards.

Such a simple listing does not have the authority of the old CEPT register. It can give no assurance that the SSs described would operate satisfactorily and would not compromise the operation either of the network which supported the SS or that of any other network to which it was connected. Such information should be contained in those documents setting out the Stage 1 description of the service.

On the other hand, such a listing is of assistance to harmonization and can prevent the wastage of a valuable number resource by preventing the unnecessary use of unallocated codes.

It is recommended that an allocation of switching orders be associated with the register.

7.4 Construction of the register

The current ETSI register of SS codes is given in annex A. It contains a listing of SSs, identified by their titles and associated with their allocated service code and/or switching order(s).

Each service is defined in a manner which is intended to be unambiguous and worded in user related terms. Where possible the definition is given in a form that is independent of the network over which it is offered.

The status of the service and its code is listed (in this case, all are listed as approved).

A reference is given to the source of each definition.

The register is supported by the database described in clause 9.

7.5 Use of the register

It is intended that the ETSI register of SS codes will provide the primary source of reference to available SSs. It will provide a standard listing of service names in English together with the recommended SS codes and switching orders.

The provision of a set of clear, network independent definitions in one place should prevent the proliferation of "new services" which provide the same functions as existing services.

It should prevent the use of different codes for the same service and the list of SS definitions should assist service providers when deciding whether a service is new or not.

8 Legislation and the ETSI register

The ONP framework Directive, 90/387/EEC [1] is a Directive intended to harmonize "the conditions for open and efficient access to and use of public telecommunications networks and, where applicable, public telecommunications services". It provided the basis for the Council Recommendation of the provision of harmonized ISDN access arrangements and a minimum set of ISDN offerings in accordance with ONP principles (92/383/EEC) [2].

This Recommendation calls for the standardization of a number of ISDN SS offerings such as call transfer services, call forwarding services, closed user group, user to user signalling, malicious call identification etc.

Pursuant to Article 5 (1) of Directive 90/387/EEC [1] the Commission publishes a list of standards for technical interfaces and/or service features in the context of open network provision and included in this reference list are the ETSI standards relevant to the above noted SSs.

Meeting one of these reference standards carries the presumption of compliance with ONP essential requirements or the requirement to provide open and efficient access. The presumption is applicable to each technical interface and/or service feature individually.

Directive 95/62/EC [3] on the application of ONP to voice telephony requires in Article 4 the publication of adequate information on access to and the use of the telephony service which is interpreted in annex 1 as including the publication of any signalling protocols.

The present draft Commission Radio and Telecommunications Terminal Equipment (R&TTE) Directive currently requires that operators shall publish adequate technical specifications of all interfaces in sufficient detail to permit the design of terminal equipment able to utilize all services provided through the corresponding interface.

Thus it can be seen that European legislation is leading towards the requirement to publish details of all public interfaces to telecommunications networks together with the necessary operating protocols to enable the use of the services provided across all such interfaces. The compliance with ETSI standards for SSs can be expected to be deemed to demonstrate compliance with the necessary requirements.

The use of the ETSI register of SS codes will assist network operators and service providers to satisfy the requirements of the relevant legislation in a harmonized manner.

9 Database

9.1 Structure of the database

The database was generated using Microsoft Access© (Version 2) so as to be backwards compatible with as many users as possible. It is constructed in the form of four tables, each of the four tables being linked to the others in the form of a relational database containing:

1) a listing of service providers together with contact names and addresses;

2) a listing of Network Types;

3) a listing of SS names and definitions;

4) a listing of service titles and codes, together with the network type and service providers name.

Tables 1 to 3 have associated forms into which the relevant information can be entered directly. Otherwise information can be entered into table 4 via a single Data Entry form in which it is possible to select for entry existing information from tables 1 to 3 or to enter new information via sub-forms which are opened automatically when required.

The three sub-forms are the original three forms for information entry in to tables 1 to 3:

- One for adding details of a service provider, structured in a similar form to the questionnaire to assist data entry;
- A second for entering a new network type;
- And a third for entering a new SS title and description.

As each sub-form is closed, the information it contains is entered into the main database.

9.2 Use of the database

As the information is contained in one large relational database it may be used to extract information in many ways. Suitably filtered queries permit the listing, for example, of all of the SS names, listed in alphabetical order, together with the names of service providers offering them and the codes used.

Alternatively the same information can be provided listed in the order of the service codes or service providers.

Such listings are very useful to experts in determining duplications and differences in code usage when analysing the information, but they are unlikely to be of particular interest to the ETSI Secretariat when maintaining the database.

Nevertheless the database provides all of the information in a structure constructed so as to act as the basis of an interactive web site.

10 Application procedures

10.1 Procedure

The rules for the allocation of Service Codes set out in ES 201 382 [9] state that a code can only be allocated when the SS to which the code is to be assigned had been fully described. The allocation of a code can be proposed and a code can be reserved as proposed for one year. If sufficient description of the service has not been produced within that year, the code will be made free for another allocation.

Similar rules govern the allocation of switching orders.

The procedures for a service provider of a SS who wishes to obtain a new code are then as follows:

- a service provider considers that he has available a new SS;
- he then consults ETSI register of titles and definitions to see if such a SS has been described before;
- if his "new" SS is not described in the register he provides a definition of his service to the ETSI Secretariat and lays claims to a title and a service code;
- the ETSI Secretariat then checks the code list for conflicts, if none are found it confirms the allocation and adds the code title and definition as a provisional entry to the register on the ETSI web site;
- at the same time, the ETSI Secretariat informs the Chairmen of HF, NA, SMG and TETRA of the new provisional entry;
- if any Chairman is dissatisfied with the definition provided for the new service the ETSI Secretariat is informed and the Secretariat seeks clarification from the service provider;
- the ETSI Secretariat receives any fuller description of the SS provided by the service provider within 12 months and forwards them to the relevant TB Chairmen;
- the TB Chairmen agree that the description provided is "sufficient" and the code is then confirmed as a valid entry in the register.

During the provisional year, any other service provider may use the code at his own risk, with the possibility that it may not be finally accepted. If he wishes, he may register himself as an interested party (together with his own description definition) with the ETSI Secretariat so that he can be kept informed of progress on the registration of the code and should have the opportunity to provide the full description himself if the original registrant fails to do so.

10.2 Responsibilities of applicant

A service provider who considers that he has available a new SS should first consult the ETSI register for SS codes with particular attention to the list of titles and definitions to see if such a SS has been described before.

If his "new" SS is not described in the register he may then provide a definition of his service to the ETSI Secretariat and lay claim to a title and a service code using the form given in annex A.

When the Secretariat is satisfied that the form is correctly completed and the code, title and definition have been entered as a provisional entry to the register on the ETSI web site that service and code may be used.

During the provisional year, the service provider shall provide any clarification necessary to his definition of the service.

10.3 Responsibilities of the ETSI Secretariat

Upon receipt of a completed application form the ETSI Secretariat shall check it for correctness and refer back to the applicant if necessary. When a correctly completed form is received the ETSI Secretariat will check the code list for conflicts, and, if none are found, will confirm the allocation to the applicant and add the code title and definition as a provisional entry to the register on the ETSI web site.

At the same time, the ETSI Secretariat will inform the Chairmen of HF, NA, SMG and TETRA of the new provisional entry.

If the description provided is considered insufficient, the Chairman of TC-HF will inform the ETSI Secretariat who will in turn seek clarification from the applicant.

Any fuller description of the SS provided by the service provider within 12 months will be forwarded by the ETSI Secretariat to the relevant TB Chairmen.

When the Chairman of TC-HF informs the ETSI Secretariat that the description provided is "sufficient", the code is then confirmed as a valid entry in the register.

If 12 months has passed before the process has been completed the ETSI Secretariat shall inform the Chairman of TC-HF who will decide whether the code application should be considered as failed.

If a code application is considered failed, the ETSI Secretariat will so inform the applicant and the code will be made available for other use.

10.4 Responsibilities of TC-HF chairman

The TC-HF Chairman will act as a central co-ordination point for the consultation process with e.g. the NA, SMG and TETRA Chairmen.

The Chairman will receive from the ETSI Secretariat details of a new provisional entry.

If the description provided is considered insufficient, the Chairman of TC-HF will inform the ETSI Secretariat who will in turn seek clarification from the applicant.

As soon as the description provided is considered sufficient, the Chairman of TC-HF will instruct the ETSI Secretariat to confirm that the code application is valid.

If the ETSI Secretariat informs the Chairman of TC-HF that 12 months has passed and that the process has not been completed the Chairman of TC-HF will decide whether the code application should be considered as failed and instruct the ETSI Secretariat accordingly.

11 Conclusions and recommendations

There were disappointingly few answers to the questionnaire, so few as to cast some doubt on the validity of some of the conclusions that might be drawn from them.

Although, during the activity of the task, 175 services were investigated and well over 100 defined, subsequent analysis and refinement of the information has resulted in 108 services and codes being listed in the current version of the register.

This working version of the register only contains details of those services claimed to be used by some 16 respondents together with a few unclaimed codes listed in the ETSI GSM and TETRA standards. Thus although any code in the list is probably in use, the information collected from the answers to the questionnaire is insufficient to establish that any other particular code is not in use.

It is recommended:

1) that the procedure described in clause 9 and set out in the associated ES 201 382 [9] is endorsed by TC-HF;

2) that the ETSI register of SSs and codes be placed on the ETSI web site available for public access with interactive provision to permit application for a new code;

3) that an allocation of switching orders is associated with the ETSI register;

4) that TC-HF should send copies of the present document to other relevant TB Chairmen asking them to canvass their members to see if the list of services and codes is complete enough to satisfy their needs.
Their members should be invited to provide the necessary information on any missing services and any resulting replies should then be treated as new applications and entered in the register as such.

Annex A (informative): ETSI Register of SS codes

Service: Abbreviated dialling, Packet selection .....Code: 50

Abbreviation:

Definition: Abbreviated dialling is the possibility for a subscriber to make a call by sending a short code instead of a full number. Packet selection is the process of selecting the size of the short code package before the first number registration.

Status: Approved

Source Reference: T/CAC S 10.5 A2, SF 1.1.3, T/CAC 02 E

Service: Abbreviated dialling, Registration..... Code: 51

Abbreviation:

Definition: Abbreviated dialling is the possibility for a subscriber to make a call by sending a short code instead of a full number. Registration is the process of assigning a number to one of a list (or packet) of short codes allocated by the service provider.

Status: Approved

Source Reference: T/CAC S 10.5 A2, SF 1.1.2, T/CAC 02 E

Service: Absent subscriber Date, Time, Tel. Number .....Code: 20

Abbreviation:

Definition: The possibility for a subscriber to have incoming calls automatically diverted to an announcement with subscriber selected Date, Time and Telephone Number, without message accepting capability.

Status: Approved

Source Reference: SF 4.1.9

Service: Access priority ..... Code: 74

Abbreviation: AP

Definition: A supplementary service that enables a user to have preferential access to the system in times of radio link congestion.

Status: Approved

Source Reference: ETS 300 392-10-09

Service: Account card calling..... Code: 15 (SF)

Abbreviation:

Definition: Enables the served user to make a call from any card reading terminal and to have the charges for the call to automatically debited to a domestic or business account number as defined by the account card content.

Status: Approved

Source Reference: T/CAC S 10.5 A2 (16.3)

Service: Advice of charge, Call set-up..... Code: 461

Abbreviation: AOC-S

Definition: The advice of charge at call set-up supplementary service provides the served user with information about the charging rates at the time of call establishment. The charge information given relates to the charges incurred on the network to which the served user is attached.

Status: Approved

Source Reference: After ETS 300 178

Service: Advice of charge, During call, cumulative ..... Code: 462

Abbreviation: AOC-D

Definition: The advice of charge, during call supplementary service provides the served user with cumulative charging information during the active phase of a call. Dependent on the option chosen at the time of subscription, the information can be sent for all calls, or on a per call basis. The charge information given relates to the charges incurred on the network to which the served user is attached.

Status: Approved

Source Reference: T/CAC S 10.7 E, see also ETSI 300 179

Service: Advice of charge, During call, incremental..... Code: 463

Abbreviation: AOC-D

Definition: The advice of charge, during call supplementary service provides the served user with incremental charging information during the active phase of a call. Dependent on the option chosen at the time of subscription, the information can be sent for all calls, or on a per call basis. The charge information given relates to the charges incurred on the network to which the served user is attached.

Status: Approved

Source Reference: T/CAC S 10.7 E, see also ETSI 300 179

Service: Advice of charge, End of call..... Code: 464

Abbreviation: AOC-E

Definition: The advice of charge at end of call supplementary service provides the served user with charging information for a call when the call is terminated. Dependent on the option chosen at the time of subscription, the information can be sent for all calls, or on a per call basis. The charge information given relates to the charges incurred on the network to which the served user is attached.

Status: Approved

Source Reference: After ETSI 300 180, T/CAC 02 E

Service: Alarm call, casual ..... Code: 55

Abbreviation: ALM

Definition: The possibility for a user to place an alarm call or calls to be made to his line within the next 24 hours at a time specified in advance by him and to hear an appropriate announcement when the call is answered.

Status: Approved

Source Reference: SF 2.1.3

Service: Alarm Call Regular, Number of days..... Code: 56

Abbreviation: ALM-N

Definition: The possibility for a user to cause an alarm call or calls to be delivered to his line regularly at the same time on a number of consecutive days. This may be for a specified or unspecified period. The time and duration to be indicated in advance by the user. When the alarm call is answered an appropriate announcement is given.

Status: Approved

Source Reference: SF 2.1.4

Service: Alarm call, programme..... Code: 57

Abbreviation:

Definition: The possibility for a user to cause an alarm call to be made automatically to his line at the same time on certain days in accordance with a specified programme. The time and the programme of days to be specified in advance by the user. When the alarm call is answered an appropriate announcement is given.

Status: Approved

Source Reference: SF2.1.6

Service: Alarm (Warning) ..... Code: 87, 88

Abbreviation:

Definition: The Alarm (Warning) Supplementary Service enables a suitable signalling device, e.g. a key or sensor device, at the customers premises which when operated will cause the network to send information to identify the particular premises to a specified terminal, e.g. to the Police or to a security agency. Signals will be continuously exchanged between the network and the customers premises to protect against faults or sabotage.

Status: Approved

Source Reference: T/CAC S 10.5 A2 18.1

Service: Ambience listening ..... Code: 841

Abbreviation: AL

Definition: A supplementary service which enables a control point to place a terminal into a special type of voice call teleservice whereby the called terminal transmits without any action from, or indication to, the called user.

Status: Approved

Source Reference: ETS 300 392-10-21 (TETRA)

Service: Area selection ..... Code: 48

Abbreviation: AS

Definition: Area Selection (AS) allows an authorized user to define areas for selection and a served user to choose, on a call by call basis, a selected area to be used for establishing a call.

Status: Approved

Source Reference: ETS 300 392 10-8 (TETRA)

Service: Automatic Personal Call ..... Code: 73

Abbreviation: APC

Definition: With prior indication from a subscriber an operator may be associated (may intervene in) with an automatically dialled call at the appropriate stage to determine if the wanted (called) person (party) is available.

Status: Approved

Source Reference: SF 6.8

Service: Barring, all services ..... Code: 330

Abbreviation:

Definition: This code describes all call barring services and is used in the deactivation command dialogue.

Status: Approved

Source Reference: ETSI 300 511

Service: Barring of Incoming Calls when roaming outside home PLMN country ..... Code: 351

Abbreviation: BIC-Roam

Definition: With this barring service, calls which are terminated for the served mobile subscriber will be barred if the subscriber is roaming outside the PLMN country (i.e. the programme is active and operative). The ability to receive calls in the PLNM home country is unaffected (i.e. the programme is active and quiescent)

The ability of the served mobile subscriber to set-up outgoing calls remain unaffected.

Status: Approved

Source Reference: ETS 300 520 (GSM 02.88)

Service: Barring of Outgoing International calls ..... Code: 331

Abbreviation: BOIC

Definition: With this supplementary service, outgoing call set-up possibilities exist only to subscribers of the PLMN and the fixed networks of the country where the mobile subscriber is presently located. So the present PLMN may be the home PLMN or a visited PLMN, respectively the fixed network may be that of the home PLMN country or that of a visited PLMN country.

Status: Approved

Source Reference: ETS 300 520 (GSM 02.88)

Service: Barring all Outgoing international calls except to the home country ..... Code: 332

Abbreviation: BOIC-exHC

Definition: This service makes it possible for a mobile subscriber to have barring of all outgoing calls except those directed to subscribers of the PLMN(s) and the fixed network(s) of the country where the mobile subscriber is presently located or to mobile subscribers of the home PLMN of the served mobile subscriber and to subscribers of the fixed network(s) in the home PLMN country..

The ability of the served mobile subscriber to receive calls and to set-up emergency calls remains unaffected.

Status: Approved

Source Reference: ETS 300 520 (GSM 02.88)

Service: Barring, Incoming calls..... Code: 35

Abbreviation: BIC

Definition: The possibility for a fixed or mobile subscriber to prevent all or certain incoming calls to his telephone number. The service may be fully service provider controlled, or registered with a service provider but subscriber controlled, or barring category fully selected and controlled by the subscriber.

The ability of the served subscriber to set up outgoing calls remains unaffected.

Status: Approved

Source Reference: SF 3.2 ETSI 300 520 (GSM 02.88)

Service: Barring Incoming calls, all services ..... Code: 353

Abbreviation:

Definition: This code describes all incoming call barring services and is used in the deactivation command dialogue.

Status: Approved

Source Reference: ETSI 300 511

Service: Barring, Outgoing calls..... Code: 33

Abbreviation: BOC

Definition: The service provides the possibility for a fixed or mobile subscriber to prevent all or certain outgoing calls and/or service control operations from his telephone line. The service may be fully service provider controlled, registered by the service provider but subscriber controlled or fully controlled by the subscriber. When all calls are barred, there are no outgoing call set-up possibilities, except for emergency calls.

Status: Approved

Source Reference: SF 3.1.1, T/CAC S 10 A2 5.3. ETSI 300 520 (GSM 02.88)

Service: Barring Outgoing calls, all services ..... Code: 333

Abbreviation:

Definition: This code describes all outgoing call barring services and is used in the deactivation command dialogue.

Status: Approved

Source Reference: ETSI 300 511

Service: Barring, Outgoing calls, subscriber selected ..... Code: 34

Abbreviation:

Definition: This service provides the subscriber with the possibility to prevent all or certain types of outgoing calls and/or service control operations from his telephone line. When he applies the restriction the subscriber can select one or a number of types of restriction prescribed by the service provider.

Status: Approved

Source Reference: SF 3.1.3

Service: Barring, Selective, Incoming Calls..... Code: 93

Abbreviation:

Definition: The possibility for a subscriber to register up to 10 numbers so as to prevent incoming calls from up to 10 numbers to his own number or to bar all incoming calls except calls originating from up to 10 numbers selected by the user.

Status: Approved

Source Reference: SF 3.2.4

Service: Barring, Selective, Incoming Calls, up to 10 numbers barred..... Code: 931

Abbreviation:

Definition: The possibility for a customer to prevent incoming calls from up to ten numbers to his own number.

Status: Approved

Source Reference: SF 3.2.4, T/CAC S 10.5 5.2

Service: Barring, Selective, Incoming Calls, all but 10 numbers barred..... Code: 932

Abbreviation:

Definition: The possibility for a subscriber to bar all incoming calls except calls originating from up to 10 numbers selected by the subscriber.

Status: Approved

Source Reference: SF 3.2.4, T/CAC S 10.5 5.2

Service: Barring, Selective, Outgoing Calls, up to 10 numbers barred ..... Code: 931

Abbreviation:

Definition: This service provides the subscriber with the possibility to prevent outgoing calls to up to ten numbers from his telephone line.

Status: Approved

Source Reference: STF and Portugal Telecom

Service: Call authorized by dispatcher ..... Code: 86

Abbreviation: CAD

Definition: The supplementary service Call Authorized by Dispatcher (CAD) ensures that predefined TETRA calls do not proceed without first being authorized by a dispatcher. The predefined user is forced to be authorized from the dispatcher before the request for service can proceed. The restricted user can be either the calling user (A) or the called user (B) or both.

Status: Approved

Source Reference: ETS 300 392 11-06 (TETRA)

Service: Call Completion, No Reply ..... Code: 16 (Pt)

Abbreviation: CCNR

Definition: The Completion of Calls on No Reply supplementary service allows a calling user A encountering a non-answering destination to be notified when the destination B becomes available.

Status: Approved

Source Reference: T/CAC S 10.5 A2 6.4

Service: Call Deflection ..... Code: 66

Abbreviation: CD

Definition: The Call Deflection supplementary service enables the served user to respond to an incoming call by requesting redirection of that call to another user. The CD supplementary service can only be invoked before the connection is established by the served user, i.e. in response to the offered call, or during the period that the served user is being informed of the call. The served user's ability to originate calls is unaffected by the CD supplementary service.

Status: Approved

Source Reference: ETSI 300 202

Service: Call Forwarding, all services ..... Code: 002

Abbreviation:

Definition: This code describes all call forwarding services and is used in the deactivation command dialogue.

Status: Approved

Source Reference: ETS 300 511

Service: Call Forwarding, Busy ..... Code: 67

Abbreviation: CFB

Definition: The Call Forwarding Busy supplementary service permits a served user to send to another number all incoming calls, or just those associated with a specific basic service, addressed to the users number and meeting busy. The served users outgoing calls are unaffected.

Status: Approved

Source Reference: T/CAC S 10.5 E. A2 9.2

Service: Call Forwarding, Busy, One of a Group ..... Code: 68

Abbreviation: CFB-G

Definition: This service allows a subscriber to have calls meeting busy indication to be forwarded to any one of a group of pre-selected numbers .

Status: Approved

Source Reference: SF 5.2. T/CAC S 10.5 9.10

Service: Call Forwarding Conditional ..... Code: 12

Abbreviation:

Definition: This service allows the user to activate both Call Forwarding on Busy and Call Forwarding on No Reply at the same time.

Status: Approved

Source Reference: STF and Portugal Telecom

Service: Call Forwarding Conditional, all services..... Code: 004

Abbreviation:

Definition: This code describes all conditional call forwarding services and is used in the deactivation command dialogue.

Status: Approved

Source Reference: ETS 300 511

Service: Call Forwarding, No reply..... Code: 61

Abbreviation: CFNR

Definition: This service permits a served user to send to another number all incoming calls, or just those associated with a specific basic service, which meet with no reply and are addressed to the users number. The served users outgoing calls are unaffected.

Status: Approved

Source Reference: T/CAC S 10.5 A2 9.3 ETS 300 201

Service: Call Forwarding, No reply, to One of a Group ..... Code: 62

Abbreviation: CFNR-G

Definition: This service allows a subscriber to have calls which remain unanswered for a predetermined time to be forwarded to one of a group of pre-selected numbers.

Status: Approved

Source Reference: SF 4.1.14

Service: Call Forwarding, No reply, to Dictated Voice Message ..... Code: 64

Abbreviation: CFNR-VM

Definition: This service gives a subscriber who cannot answer his calls because he is absent to divert these calls to a voice message dictated by the subscriber.

Status: Approved

Source Reference: SF 4.1.23

Service: Call Forwarding, Not Reachable ..... Code: 62

Abbreviation: CFNR

Definition: This service permits a called mobile subscriber to have the network send all incoming calls, or just those associated with a specific Basic service group, addressed to the called mobile subscriber's directory number, but which is not reachable, to another directory number. The ability of the served mobile subscriber to originate calls is principally unaffected, but practically it is affected if the mobile subscriber is de-registered, if there is radio congestion or if the mobile subscriber for example is being out of radio range.

Status: Approved

Source Reference: GTS GSM 02.82

Service: Call Forwarding, Selective, Registration ..... Code: 210

Abbreviation:

Definition: This supplementary service permits a served user to register the set of number (10 maximum) from which either all incoming calls will be diverted or offered in the normal manner all other calls being diverted.

Status: Approved

Source Reference: SF 5.2.1

Service: Call Forwarding, Selective, up to 10 numbers ..... Code: 211

Abbreviation:

Definition: This supplementary service permits a served user to forward to a nominated number only those calls from a pre-determined set of up to 10 numbers.

Status: Approved

Source Reference: After SF 5.2.1

Service: Call Forwarding, Selective, all but to 10 numbers ..... Code: 212

Abbreviation:

Definition: This supplementary service permits a served user to forward to a nominated number all calls except those from a pre-determined set of up to 10 numbers.

Status: Approved

Source Reference: After SF 5.2.1

Service: Call Forwarding, Unconditional to any number ..... Code: 21

Abbreviation: CFU

Definition: This supplementary service permits a served user to have all incoming calls, or just those associated with a specified basic service, addressed to the served users number, to be forwarded to another number. The served users outgoing calls are unaffected. If CFU is activated calls are forwarded no matter what the condition of the termination.

Status: Approved

Source Reference: T/CAC S 10.5 A2 9.1

Service: Call Forwarding, Unconditional to Announcement ..... Code: 24

Abbreviation: CFU-A

Definition: This supplementary service permits a served user to have all incoming calls to be forwarded to a fixed announcement. The caller may be invited to leave a message.

Status: Approved

Source Reference: SF 4.1.11, 4.1.12

Service: Call Forwarding, Unconditional to Dictated Voice Message ..... Code: 29

Abbreviation: CFU-VM

Definition: This supplementary service permits a served user to have all incoming calls forwarded to an announcement service with a voice message pre-recorded by the subscriber.

Status: Approved

Source Reference: SF 4.1.5

Service: Call Forwarding Unconditional, to fixed number ..... Code: 22

Abbreviation: CFU-N

Definition: This supplementary service permits a served user to have all incoming calls, or just those associated with a specified basic service, addressed to the served users number, to be forwarded to another number. The served users outgoing calls are unaffected. If CFU is activated calls are forwarded no matter what the condition of the termination.

Status: Approved

Source Reference: T/CAC S 10.5 A2 9.1

Service: Call Forwarding, Unconditional, to Operator ..... Code: 23

Abbreviation: CFU-OP

Definition: This service allows a subscriber to have incoming calls to be forwarded to an operator.

Status: Approved

Source Reference: SF 5.1

Service: Call Hold ..... Code:94, SO 2

Abbreviation: HOLD

Definition: The Call Hold Supplementary Service allows a user to interrupt communication on an existing call and then subsequently, if desired, to re-establish communication.

Status: Approved

Source Reference: T/CAC S10 A2 13.1

Service: Call Rejection, no CLIP ..... Code: 15 (Pt)

Abbreviation:

Definition: A call barring service which rejects incoming calls from a source which has implemented Calling Line Identification Rejection

Status: Approved

Source Reference: ETSI STF117

Service: Call Return ..... Code: 92

Abbreviation: CALLRET

Definition: This service provides the possibility to activate an automatic call back to the last number which called and received ringing tone, no reply.

Status: Approved

Source Reference: SF 6.10.1

Service: Call Transfer, Explicit ..... Code: 96

Abbreviation: CT

Definition: This service enables a user who has two calls, either of which can be either an incoming or outgoing call, to connect the two parties together in the two calls.

Status: Approved

Source Reference: T/CAC S 10.5 A2 13.3-1

Service: Call Waiting ..... Code: 43, SO 0,1,2,3,4

Abbreviation: CW

Definition: This service enables a busy user to be notified of an incoming call in a waiting position. The notification indicates that no information interface channel is available. The user then has the choice of accepting, rejecting or ignoring the waiting call making use of Switching Orders..

Status: Approved

Source Reference: T/CAC S 10 A2 6.1

Service: Calling Line Identification Presentation ..... Code: 30

Abbreviation: CLIP

Definition: This service provides the called party with the possibility to receive identification of the calling party.

Status: Approved

Source Reference: CAC 10 A2 14.3

Service: Calling Line Identification Presentation on Call Waiting..... Code: 43, SO 1,2

Abbreviation: CLIP-CW

Definition: A service which when an incoming call notified as Call Waiting is presented, also presents the calling party's identity.

Status: Approved

Source Reference: ETS 300 091

Service: Calling Line Identification Restriction..... Code: 31

Abbreviation: CLIR

Definition: This service enables the calling party to prevent presentation of its number to the called party.

Status: Approved

Source Reference: T/CAC S 10 A2 14.4. ETS 300 090

Service: Calling Line Identification Restriction, Per call..... Code: 31

Abbreviation: CLIR

Definition: If the calling party has subscribed to the CLIR supplementary service, the network shall normally invoke the restricted value for the service on a call by call basis, by default. The default value may be overridden by the subscriber on a call- by- call basis.

Status: Approved

Source Reference: ETS 300 090

Service: Carrier Selection ..... Code: 09

Abbreviation:

Definition: This service allows the user to select a preferred carrier from a number of alternatives that may be available.

Status: Approved

Source Reference: TC-HF, ETSI TR-101-092

Service: Charge limitation by charge units .....Code: 17Pt

Abbreviation:

Definition: This service allows the user to limit the cost of outgoing calls by selecting a maximum number of charge units (e.g. pulses) to use for outgoing calls. When this value is reached the user can no longer originate outgoing calls although the ability to receive incoming calls is unaffected..

Status: Approved

Source Reference: STF and Portugal Telecom

Service: Closed User Group ..... Code: 01

Abbreviation: CUG

Definition: This service enables users to form groups to and from which access is restricted. Members of a specific CUG can communicate among themselves, but not, in general, with users outside the group. Specific User group members can have additional capabilities that allow them to originate calls outside the group and/or to receive calls from outside the group.

Status: Approved

Source Reference: T/CAC S 10 A2 5.1 SF 3.3.1

Service: Completion of Calls on No Reply.....Code: 16 (Pt)

Abbreviation: CCNR

Definition: The Completion of Calls on No Reply supplementary service allows a calling user A encountering a non-answering destination to be notified when the destination B becomes available.

Status: Approved

Source Reference: T/CAC S 10.5 A2 6.4

Service: Completion of Calls to Busy Subscriber ..... Code: 37

Abbreviation: CCBS

Definition: This service allows a calling user to A encountering a busy destination B to have the call completed when the busy destination B becomes idle, without having to make a new attempt

Status: Approved

Source Reference: T/CAC S 10 A2 6.2 ETS 300 357 SF 3.3.1

Service: Conference call, 3-party..... Code: 95

Abbreviation: 3PTY

Definition: The 3-party Supplementary Service enables a user to establish a 3-party conversation, i.e. a simultaneous communication between the served user and two other parties.

Status: Approved

Source Reference: T/CAC S 10 A2 13.2 ETS 300 186

Service: Conference call, Add on ..... Code: 71

Abbreviation: CONF

Definition: This service provides a user with the possibility to have a multi-connection call with simultaneous two-way communication between more than two parties.

Status: Approved

Source Reference: T/CAC S 10 A2 13.4 SF 11.2.3-11.2.6 ETS 300 183

Service: Conference call, Meet me ..... Code: 72

Abbreviation: MMC

Definition: The Conference Call, Meet me supplementary service provides a user with the ability to arrange for a conference between more than two participants with all participants accessing the conference themselves.

Status: Approved

Source Reference: T/CAC S 10 A2 13.5 ETS 300 164

Service: Connected Line Identification Presentation ..... Code: 76

Abbreviation: COLP

Definition: This service enables the called party to receive at the establishment of the call an indication of the number of the connected line including possible additional address information.

Status: Approved

Source Reference: T/CAC S 10 A2 14.3 ETS 300 094

Service: Connected Line Identification Restriction ..... Code: 77

Abbreviation: COLR

Definition: This service enables the connected party to restrict presentation of the connected party's number to the calling party.

Status: Approved

Source Reference: T/CAC S 10 A2 14.4 ETS 300 095

Service: Discreet listening ..... Code: 842

Abbreviation: DL

Definition: A facility whereby an authorized user may listen to one or more communications between subscribers without any indication to any user that the communication is being monitored.

Status: Approved

Source Reference: ETS 300 392-10-20

Service: Distinctive Ringing ..... Code: 91

Abbreviation:

Definition: The possibility for a user to receive a distinctive ringing (call arrival indication) at his telephone when receiving calls from a set of numbers previously registered for this service.

Status: Approved

Source Reference: SF 14.9.1

Service: Do not disturb, announcement ..... Code: 26

Abbreviation:

Definition: The possibility for a subscriber who does not wish to answer his telephone to have incoming calls diverted to a common recorded announcement in the exchange. The announcement will give appropriate information to callers during the period of time the service is in operation.

Status: Approved

Source Reference: SF 5.1.4

Service: Do not disturb, in hunt group ..... Code: 49

Abbreviation: DND

Definition: The supplementary service Do Not Disturb enables a served user to cause the PTN to reject any calls, or just those associated with a specified basic service, addressed to the served user's PTN or hunting group number. The calling user is given an appropriate indication. Incoming calls are rejected as long as the service is active. The served user's outgoing service is unaffected.

Status: Approved

Source Reference: ETS 300 363

Service: Dynamic group number assignment ..... Code 85

Abbreviation: DGNA

Definition: This supplementary service enables a served user dynamically to create, modify or delete groups of subscribers identified by a single group number.

Status: Approved

Source Reference: After ETS 300 392-10-22

Service: Enhanced multi-level precedence and pre-emption ..... Code: 75 and 75n (n=0-4)

Abbreviation: eMLPP.

Definition: The enhanced Multi-Level Precedence and Pre-emption Service has two parts: precedence and pre-emption. Precedence involves assigning a priority level to a call in combination with fast call set-up. Pre-emption involves the seizing of resources, which are in use by a call of a lower precedence, by a higher level precedence call in the absence of idle resources. Pre-emption can also involve the disconnection of an on-going call of lower precedence to accept an incoming call of higher precedence.

Status: Approved

Source Reference: GTS GSM 02.67

Service: Fixed destination call..... Code: 53

Abbreviation:

Definition: The possibility for a subscriber to set up a call to a predetermined number, nominated by the subscriber, by lifting the handset only. The fixed destination is registered by the subscriber. The service can also be referred to as Hot Line.

Status: Approved

Source Reference: SF 1.2.2 T/CAC S 10 A2 1.2

Service: Fixed destination call, timed (with timeout) ..... Code: 53

Abbreviation:

Definition: The possibility for a subscriber to set up a call to a predetermined number, nominated by the subscriber, by lifting the handset only. The predetermined number will be called after a short time period if dialling has not commenced during this period. The registration of the fixed destination and the deactivation of the service is done by the subscriber. The time out function enables the controlling subscriber to make normal outgoing calls from his terminal as well as to deactivate the service by means of the appropriate procedure. Incoming calls are not affected by the service.

Status: Approved

Source Reference: Derived from SF 1.2.2 T/CAC S 10 A2 1.2

Service: General de-activation ..... Code: 001

Abbreviation:

Definition: The possibility for a subscriber to deactivate all supplementary services activated on his line, except Abbreviated Dialling and services requiring keywords.

Status: Approved

Source Reference: T/CAC S 10.5 E annex 2, 10.2

Service: Home meter ..... Code: 45

Abbreviation:

Definition: The possibility for a subscriber to have a meter at his own premises showing the number of call charge units debited

Status: Approved

Source Reference: SF 7.3.3 7.3.5

Service: Last Number repetition ..... Code: 52

Abbreviation: LNR

Definition: The possibility for the subscriber to store the last number dialled and to be able to repeat that number by dialling a short code.

Status: ?

Source Reference: SF 6.2.1. T/CAC S 10 A2 1.3

Service: Late entry ..... Code: 65

Abbreviation: LE

Definition: This supplementary service allows radio users to be informed of and, if they are concerned, to join an already existing multipoint speech call.

Status: Approved

Source Reference: ETS 300 392-10-14

Service: Line Hunting, Inhibit, Reduce..... Code: 47

Abbreviation:

Definition: The automatic selection of a free line from a group of lines serving a subscriber on receipt of a call to that subscribers general directory number. The subscriber has the possibility to inhibit or reduce hunting.

Status: Approved

Source Reference: SF 12.2 and 12.2.5

Service: Listening ..... Code: 84

Abbreviation:

Definition: Code allocated but service not described.

Source Reference: ETR 294 TETRA

Service: Malicious Call Identification..... Code: 39

Abbreviation: MCID

Definition: The Malicious Call Identification supplementary service enables a user to request that the source of an incoming call is identified and registered by the network.

Status: Approved

Source Reference: ETS 300 128 CAC 10.7 A13

Service: Multiple subscriber profile..... Code: 59n

Abbreviation:

Definition: Multiple Subscriber Profile is an optional service to enable mobile subscribers to have several profiles associated with a single SIM and a single IMSI, with each profile being a subscription option. Each profile may be used for mobile originated and mobile terminated calls. (n = 0 – 9)

Up to four different profiles can be provisioned against a subscriber using the MSP feature. This will allow the subscriber to separate their telecommunication service needs into different identities (e.g. business and home).

Status: Approved

Source Reference: GTS GSM 02.97

Service: Multi Party Call ..... Code: SO 1x, 2x, 3, 4

Abbreviation: MPTY

Definition: This supplementary service provides a mobile subscriber with the ability to have a multi-connection call, i.e. a simultaneous communication with more than one party.

Status: Approved

Source Reference: ETS 300 517

Service: Paging Call Pickup ..... Code: 82

Abbreviation:

Definition: A subscriber being away from his telephone can pick up a call on his line by dialling his own number and/or possibly a special code from any other telephone, after being informed by means of a paging system that there is such a call.

Status: Approved

Source Reference: SF 10.2

Service: Password Registration/Modification ..... Code: 03

Abbreviation:

Definition: This service permits a user to register a change to his password relating to the use of supplementary services in mobile networks.

Status: Approved

Source Reference: ETS 300 907 (GSM 02.30)

Service: Personal Identification Number (PIN) Registration ..... Code: 04

Abbreviation:

Definition: The service permits the user to change or register his PIN in the SIM on mobile networks.

Status: Approved

Source Reference: ETS 300 907 (GSM 02.30)

Service: Personal Identification Number 2 (PIN2) Registration ..... Code: 042

Abbreviation:

Definition: The service permits a user to change or register his PIN2 in the SIM on mobile networks.

Status: Approved

Source Reference: ETS 300 907 (GSM 02.30)

Service: Personal Identification Number (PIN) Unblock..... Code: 05

Abbreviation:

Definition: This service permits the user to change his PIN in the SIM on mobile networks without having first to enter the existing PIN.

Status: Approved

Source Reference: derived from ETS 300 511

Service: Personal Identification Number (PIN2) Unblock..... Code: 052

Abbreviation:

Definition: This service permits the user to change his PIN2 in the SIM on mobile networks without having first to enter the existing PIN2.

Status: Approved

Source Reference: derived from ETS 300 511

Service: Pre-emptive priority call, "Emergency"..... Code: 750

Abbreviation: PPC

Definition: This supplementary service enables a user to have network resources allocated at the highest level of priority in the case of an emergency even if this means that other calls with a lower priority have to be disconnected.

Status: Approved

Source Reference: After ETS 300 392-11-16, ETR 294

Service: Pre-emptive priority call, level 1..... Code: 751

Abbreviation: PPC

Definition: This supplementary service enables a user to have network resources allocated even if this means that other calls with a lower priority have to be disconnected. Level 1 is the highest level of priority.

Status: Approved

Source Reference: ETS 300 392-10-16, ETR 294

Service: Pre-emptive priority call, level 2..... Code: 752

Abbreviation: PPC

Definition: This supplementary service enables a user to have network resources allocated even if this means that other calls with a lower priority have to be disconnected. Level 2 is the second highest level of priority.

Status: Approved

Source Reference: ETS 300 392-10-16, ETR 294

Service: Presentation of IMEI..... Code: 06

Abbreviation:

Definition: A facility which causes a terminal to display its International Mobile station Equipment Identity (IMEI).

Status: Approved

Source Reference: ETS 300 511

Service: Priority Call ..... Code: 75

Abbreviation: PC

Definition: The supplementary service, priority call, gives preferential access to the network resources to calls which have been sent with priority status.

Status: Approved

Source Reference: ETS 300 392-10-10

Service: Priority call, levels 3 - 9..... Code: 753- 759

Abbreviation: PPC

Definition: This supplementary service enables a user to have network resources allocated even if this means that other calls with a lower priority have to be disconnected. Level 3 is a higher level of priority than level 9.

Status: Approved

Source Reference: ETS 300 392-10-16, ETR 294

Service: Private Numbering Plan, Support of..... Code: 07n

Abbreviation: SPNP

Definition: The Support of Private Numbering Plan (SPNP) supplementary service enables a subscriber to use a private numbering plan (PNP) for communication across one or more networks with mobile and fixed users. A PNP gives the capability to place calls by using digit sequences which may have different structures and meanings than provided by the public numbering plan. Up to 9 plans may be supported. Code 070 gives access to the public numbering plan.

Status: Approved

Source Reference: GTS GSM 02.95

Service: Reverse Charging ..... Code: 83

Abbreviation:

Definition: A service allowing a called user to be charged for the actual communication, that is, for usage- based calls.

Status: Approved

Source Reference: T/CAC S 10.5 A2 8.2, SF 7.9

Service: Sub Addressing ..... Code: 89

Abbreviation:

Definition: The Sub-addressing supplementary service allows the served user to expand his addressing capacity beyond the one given by his ISDN number. A sub-address, if presented by a calling user, is delivered unaffected to the called (served) user. Only the served user defines the significance of the sub-address.

Status: Approved

Source Reference: T/CAC S 10.5 E 2.3

Service: Terminal Portability..... Code: 79

Abbreviation: TP

Definition: This service allows a user to move a terminal from one socket to another within one basic access during the active state of a call.

Status: Approved

Source Reference: T/CAC S 10.5E A2 18.6

Service: Queue service ..... Code: 38

Abbreviation:

Definition: The possibility for a subscriber to have his calls placed in a queue when all his lines are busy.

Status: Approved

Source Reference: SF 6.9.1, T/CAC S 10.5 E

Service: Unstructured Supplementary Service Data (HPLMN) .....Code: 1X(Y)

Abbreviation: USSD

Definition: A mechanism used to support GSM SS services which are not implemented by means of the GSM specified functional signalling when in the Home PLMN. In this case X = 1 – 4 and Y = 0 - 9

Status: Approved

Source Reference: ETS 300 625

Service: Unstructured Supplementary Service Data (VPLMN).....Code: 1X(Y)

Abbreviation: USSD

Definition: A mechanism used to support GSM SS services which are not implemented by means of the GSM specified functional signalling when in the Visited PLMN. In this case X = 5 – 9 and Y = 0 - 9

Status: Approved

Source Reference: ETS 300 625

Service: User to User Signalling..... Code: 36

Abbreviation: UUS

Definition: A service which allows a user to send or receive a limited amount of information to or from another user over the signalling channel in association with a call to the other user.

Status: Approved

Source Reference: T/CAC S 10.5 11.3 ITU-T Recommendation I.257.1

Service: User to User Signalling, All services ..... Code: 360

Abbreviation:

Definition: This code describes all user to user signalling services and is used in the deactivation command dialogue.

Status: Approved

Source Reference: After GTS GSM 02.87

Service: User to User Signalling, Service 1 ..... Code: 361

Abbreviation: UUS1

Definition: A service which allows either user to include user to user information when accepting, rejecting or terminating a call. Service 1 also permits a calling subscriber to invoke the service with a call set-up and to terminate the call before connection is established.

Status: Approved

Source Reference: GTS GSM 02.87

Service: User to User Signalling, Service 2 ..... Code: 362

Abbreviation: UUS2

Definition: A service which allows either user to transfer up to two user to user messages in each direction to the other user involved in a call at any time between activation of service 2 and the establishment of the connection.

Status: Approved

Source Reference: GTS GSM 02.87

Service: User to User Signalling, Service 3 ..... Code: 363

Abbreviation: UUS3

Definition: A service which allows either user to transfer a defined amount of user to user information to the other user on a call after the connection has been established.

Status: Approved

Source Reference: GTS GSM 02.87

Annex B (informative): Allocation of switching orders for public networks

Legend:

(R) Register recall, should only be used if there is a technical need for it in the network

Switching Order	Function	Supplementary Service
(R) 0	Terminate held call Reject incoming call	Hold, 3PTY CW
(R) 1	Terminate and switch	CW, Hold, 3 PTY
(R) 2	Hold and switch	CW, Hold, 3 PTY
(R) 3	Establish 3 party connection	CW, 3 PTY
(R) 4	Transfer From 3 party connection, connect C and Hold B	CW, 3 PTY 3 PTY
(R) 5	Activate CCBS From 3 party connection, connect C and disconnect B	CCBS 3 PTY
(R) 6	From 3 party connection, connect B and Hold C	3 PTY
(R) 7	From 3 party connection, connect B and disconnect C	3 PTY
(R) 8	Terminate actual call	Hold 3 PTY
(R) 9	Accept	CFU to service centre

Annex C (informative): Extract from CEPT Recommendation T/CAC S 10.7 E

Annex 10.1

CALL FORWARDING UNCONDITIONAL

(CFU)

Operational Requirements

1. DEFINITION

The Call Forwarding Unconditional (CFU) supplementary service permits a served user to have all incoming calls, or just those associated with a specified basic service, addressed to the served user's ISDN number to another number. The served user's outgoing calls are unaffected. If CFU is activated, calls are forwarded no matter what is the condition of the termination.

2. DESCRIPTION

2.1 General Description

In normal situations, the CFU service is provided on a per access basis. (In these situations there is a one-to-one relationship between the ISDN number and the access). However, the network may recognise multiple numbers on a single interface; in addition, it may not understand a complete ISDN number (e.g. DDI). In these cases, the CFU service is offered on the basis of the part of the ISDN number recognised by the public network.

Note 1: In this service description, it is assumed that a single ISDN number is not shared across multiple interfaces. A single ISDN number may, however, be shared by multiple terminals on the same interface. For multiple access installations, it could be possible for the user to specify on activation, if the service is applicable to a specific access or all accesses associated with that installation.

Note 2: A related supplementary service could allow the possibility for users to inhibit forwarded calls from terminating on their numbers.

An indication that the forwarding service is active on a number is given to the forwarding customer each time an outgoing call is made according to the subscription options (subclause 3.1).

The maximum number of diversions to a single call is a network option with an upper limit of five. When counting the number of diversions, all types of diversions should be included.

For a given ISDN number, this service (including options) may be subscribed to for each basic service to which the user of the number subscribes, or collectively for all the basic services to which the user subscribes. Since subscription is on an ISDN number basis, the same CFU subscription will apply to all terminals using this number.

2.2. Denomination of Users

The served user is a called party

2.3. **Specific Terminology**

Calling party: The user who is originating a call to the served user. The calling party may also be called the A subscriber.

DTN: The Diverted-To Number. The number of the forwarded-to user. The number may also be called the C number.

Forwarded-to user: The user to whom the call shall be forwarded. The forwarded-to user may also be called the C subscriber.

Served user: The user of a particular ISDN number who is requesting that calls to his number be forwarded. This user may also be referred to as the forwarding user or the called user. The served user may also be called the B subscriber.

2.4 **Applicability to Telecommunication Services**

This supplementary service is applicable to all basic telecommunication services.

3. **METHOD FOR USERS TO ACCESS THE SERVICE**

3.1. **Normal Method for Users to Access the Service**

3.1.1 Provision and Withdrawal

CFU is provided after pre-arrangement with the network operator.

CFU subscription is dependent on the basic service parameter. Possible values of this parameter are as follows:

Per ISDN number:

Subscription Parameter	**Value**
Basic Service	- All basic services
	- One or more basic services

The served user can request a different forwarded-to number for each basic service subscription parameter value to which he has subscribed.

The service can be offered with four subscription options. The options apply separately to each basic service subscribed to on each ISDN number. For each subscription option, only one value can be selected. Subscription options are summarised below:

Subscription Options	**Value**
Served user receives notification that a	- No
call has been forwarded	- Yes
Calling party receives notification that	- No
the call has been forwarded	- Yes
Served user receives notification that	- No
CFU is currently activated	- Yes
Served user releases the number to	- No
the forwarded-to user	- Yes

This service will be withdrawn by the network operator at the subscriber's request or for administrative reasons.

3.1.2. *Registration and Erasure*

3.1.2.1. Registration

At registration the served user must supply:

- the forwarded-to number with the relevant sub-address, if necessary,

- an indication of the basic service(s) concerned,

- possibly the ISDN number for which CFU should apply (e.g. MSN).

According to the needs, this information profile may be different for each basic service subscribed to by the served user.

As a network option, verification of the forwarded-to number should be accomplished, if possible, before accepting the CFU registration.

When the served user registers CFU, the network shall return notification of acceptance or rejection of the request. This notification will include the number of the forwarded-to user to whom the call forwarding is registered.

3.1.2.2. Erasure

Erasure shall be possible.

3.1.3. *Activation and Deactivation*

If the served user has registered CFU, the served user may use the activation procedure.

If a single number can be used by more than one terminal, activation of CFU shall be possible from any terminal using this number. As a service option activation/deactivation may be restricted to selected terminals (e.g. by use of a keyword).

CFU can be deactivated in either of two ways. The user can specifically deactivate CFU. The user can activate CFU for the specified basic service to another number, thus causing the previous activation of CFU to be overridden.

3.1.4 *Invocation and Operation*

When CFU is active, all incoming tails shall be forwarded without being offered to the

served user. According to the subscription option selected, the served user could receive notification of call forwarding, but will not be able to answer the incoming call. .

The forwarded-to user shall receive an indication that the call has been forwarded, possibly

with the cause. The cause shall be the appropriate forwarding condition. When multiple forwarding occurs, the reason for forwarding given to the forwarded-to user should relate to the last forwarding user in the chain.

As a subscription option, the served user can request that the calling party receives a notification that the call has been forwarded.

Call forwarding applies only to subscribed basic services. Calls to an ISDN number

requesting a basic service which is not subscribed to shall not be forwarded.

Within an ISDN or tandem ISDNS the total number of all forwardings for each call shall be limited. The maximum number shall be limited to five for each call. When counting the number of diversions, all types of diversions shall be included. This is to prevent infinite

looping.

3.1.5 *Interrogation*

Interrogation of the provision of the service and the stable states shall be possible. The network response may include all information that was supplied in the last activation procedure for each basic service.

3.2. **Alternative Method for Users to Access the Service**

None identified.

3.3. **Stimulus Mode Procedures**

The service code 21 has been allocated for this service.

3.3.1. *Registration*

3.3.1.1. Registration with Activation

21 DTN#

Note: DTN = The Diverted-To Number.

3.3.1.2 Registration without Activation

21 DTN*o#

3.3.2. *Erasure*

*#21*o#*

3.3.3. *Activation*

**21#*

3.3.4. *Deactivation*

#21#

3.3.5. *Invocation*

Not applicable

3.3.6. *Interrogation*

3.3.6.1. Status Check

*# 21 #

3.3.6.2. Data Check

*# 21 * DTN #

4. USER REQUIREMENTS IN CASE OF UNSUCCESSFUL OUTCOME

If the network cannot accept a registration or activation request, the served user shall receive a notification that the operation was unsuccessful. Examples of the reason for rejection are:

- Service not subscribed to
- Basic service to which relevance is requested is not subscribed to
- Service not available by administrative reasons
- Terminal/user not allowed for service access
- Use of an operator access prefix
- Insufficient information
- Forwarded-to number is a special number (e.g. police)
- Forwarded-to number is served user's number
- Forwarded-to number is not in use
- Service not registered

However, the network is not required to validate information related to the forwarded-to user. If the user does not specify completely the CFU request to be deactivated (e.g. the basic service and/or the user's number), the network shall reject the deactivation request with appropriate cause.

If the network cannot accept a user's request for deactivation, the rejection cause shall be returned to the user, e.g.:

- Incorrect ISDN number.

If the network deactivates CFU without the served user having requested deactivation (e.g.

when an exceptional condition occurs), the served user shall receive notification along with the cause.

If the limit of successive forwardings of a call is reached and an additional attempt to forward the call is made, the ISDN calling party shall receive call clearing with appropriate cause.

If the forwarded call cannot be completed to the forwarded-to destination, then the network shall clear the call. Specifically, if CFU has been invoked, then the call shall be cleared back to the originating exchange and the calling party shall be sent a cause to indicate that the call has been forwarded but not completed (i.e. because of network congestion, invalid number, facility not available, etc.).

5. INTERWORKING AND INTERCOMMUNICATION

If the forwarded-to number is not within the ISDN, then an interworking situation is said to exist.

If a forwarded call meets an interworking situation, then an interworking indication should be sent to the calling party.

In case of interworking, appropriate tones and/or announcements should be provided.

6. INTERACTION BETWEEN SUPPLEMENTARY SERVICES IN SIMULTANEOUS USE

6.1 *Advice of Charge Services*

6.1.1. **Advice of Charge, Charging Information at Call Set-up Time** (AOC-S)

Served user: No information will be given.

6.1.2 **Advice of Charge, Charging Information During the Call (AOC-D)**

When a call is forwarded and the served user is charged for the forwarded part of the call, the charging information is not transferred to the served user.

6.1.3. **Advice of Charge, Charging Information at the End of the Call** (AOC-E)

When a call is forwarded and the served user is charged for the forwarded part of the call, the charging information may be transferred to the served user when the call is cleared.

6.2. **Call Waiting (CW)**

Calling party: No impact.')

Served user: CFU takes precedence over CW, however CFU could be activated while a call is waiting without changing the status of that call.

1) When 'No impact" stands alone, please read: i.e. neither supplementary service affects the operation of the other supplementary service.

Forwarded-to user: A forwarded call can invoke Call Waiting.

6.3. **Call Hold (HOLD)**

No impact

6.4. *Call Transfer Services*

6.4.1 **Explicit Call Transfer (ECT)**

No impact

6.4.2. **Single Step Call Transfer (SCT)**

If user C has subscribed to CFU, then the transferred call shall be forwarded to another

user, D.

6.5. *Number Identification Service*

6.5.1. **Calling Line identification Presentation (CLIP)**

Served User: If subscribed to, the served user can receive the calling line identification of all calls which have been forwarded.

Forwarded-to user: A forwarded-to user with CLIP active shall receive the number of the calling party as well as the served user. In the case of multiple forwarding the answering party. shall receive indication of the calling party, the first forwarding party, and the last forwarding party. In the case one or more of the mentioned parties have CLIR active, its number shall be replaced by an indication that the number is not available.

6.5.2 **Calling Line Identification Restriction (CLIR)**

Calling party: When CLIR is activated, the calling line identification must not be presented to the forwarded-to user unless the forwarded-to user has an override category.

6.5.3. Connected Line Identification Presentation (COLP)

If the calling party has COLP activated, it shall receive the line identity of the forwarded-to user associated with the CFU notification.

6.5.4 Connected Line identification Restriction (COLR)

No number must be presented to the calling party unless this party has an override category.

6.6 *Call Barring Services*

6.6.1 Closed User Group (CUG)

CUG restrictions must be met on each leg of the call. In addition, CUG restrictions must be

met end-to-end. In the case of multiple forwarding, CUG restrictions have to be met in each intermediate forwarding point.

Calling party/forwarded-to user: When a call is forwarded, a new check of the CUG restrictions is made at the forwarded-to destination. The CUG information sent to the forwarded-to destination is the same CUG information that was sent from the originating network.

Served user: CFU can only be activated, if CUG restrictions between the served user and the forwarded-to user are met.

6.6.2. Outgoing call Barring (OCB)

When CFU has been activated prior to the activation of OCB, the calls are forwarded regardless of the limitations of the version of OCB that has been activated, i.e. in this case there exists no interaction between the two services.

After OCB has been activated, registration of CFU can only be made to destinations which are within the limitations of the OCB version that has been activated.

6.7. Completion of Calls to Busy Subscribers (CCBS)

a) CFU activated by B before A requests CCBS on B:

If the call to destination B is forwarded to C by CFU and C is busy, then a CCBS request, if made by user A, shall be activated. User A shall be informed that CCBS has been activated. If user A activates CCBS and subsequently activates CFU, the CCBS recall shall be given to user A at his original location.

b) CFU activated by B after A requests CCBS on B:

If destination B activates CFU after user A has requested CCBS, then the CCBS request shall be cancelled.

c) CCBS activated by B to another destination D:

If user B activates CCBS to another destination D and either has already activated or subsequently activates CFU, then the CCBS recall shall be given to B at his original location.

6.8. ***Conference Services***

6.8.1. **Conference Call, Add-on (CONF)**

Calling party: If a conference controller attempts to establish a conference call and calls a user with CFU active, the forwarded-to user shall be alerted and can be added to the conference.

Forwarded-to user: A forwarded-to user can establish a conference using an existing forwarded call, as a network option.

A call that has been forwarded to the conference controller can be added to an existing conference.

6.8.2 **Meet-Me Conference (MMC)**

No impact.

6.9 **Direct Dialling In (DDI)**

No impact.

6.10 ***Diversion Services***

6.10.1. **Call Forwarding Unconditional (CFU)**

Not applicable.

6.10.2. **Call Forwarding Busy (CFB)**

The invocation of CFU takes precedence over CFB.

6.10.3. **Call Forwarding No Reply (CFNR)**

The invocation of CFU takes precedence over CFNR.

6.10.4 **Call Deflection (CD)**

CFU takes precedence over CD.

6.10.5 **Call Forwarding Unconditional to *a* Service Centre (CFU-S)**

CFU-S shall have precedence over CFU.

6.10.6 **Call Forwarding Busy to a Service Centre (CFB-S)**

No impact.

6.10.7 **Call Forwarding No Reply to a Service Centre (CFNR-S)**

No impact.

6.11 **Freephone (FPH)**

The forwarding shall be charged to the FPH customer.

It shall be a network operator option to provide for one of the following situations:

1; Freephone calls arriving at a termination shall not be subject to CFU in operation at that termination. Such calls shall be offered at that termination in the normal manner. Redirection of FPH calls shall be achieved by network operator registration.

2: Freephone calls arriving at a termination shall be subject to CFU in operation at that termination. Such calls shall be forwarded in the normal manner, i.e. CFU shall also apply to Freephone calls.

6.12 Line Hunting (LH)

Calling party: No impact.

Served user: CFU may be assignable to all or part of the hunting group. When forwarding is only required on part of the hunting group, the forwarding customer must specify, at activation, which access the service is to be invoked from. Procedures for the operation of this service in association with part of a hunt group need to be completed. In general, CFU takes precedence over LH.

Forwarded-to user: Forwarded calls shall be treated as normal calls when completing to a multi-line hunt group user.

6.13. **Malicious Call Identification** (MCID)

Forwarded-to user: MCI may be invoked for single and multiple forwarded calls. In this case,

the numbers of the original calling and the last forwarding users are registered.

6.14. **Multiple Subscriber Numbers** (MSN)

No impact.

6.15 Private Numbering Plan (PNP)

No impact.

A user who subscribes to PNP may use the PNP number to identify the forwarded-to user, when activating the service.

A PNP number maybe used to identify the forwarding user. If this user can also be uniquely identified by an LSDN E.164 number, calls to this E.164 number shall also be forwarded. Similarly, if the forwarding user is identified by an E.164 number, calls made to the corresponding PNP number (if any) shall also be forwarded.

6.16. Priority (PRI)

No impact.

6.17 Remote Control of Supplementary Services (RCSS)

No impact.

6.18. **Sub-addressing** (SUB)

The sub-address associated with the original called party is delivered to this called party and should not be forwarded, if the call is forwarded. CFU registration may include a sub-address to be associated with the forwarded-to number.

6.19 Terminal Portability (TP)

No impact.

6.20. Three-Party Service (3PTY)

No impact.

6.21. User-to-User Signalling (UUS)

Incoming calls: UUS shall follow the forwarded call.

Outgoing calls: No impact.

7. COMMERCIAL CONSIDERATIONS

7.1 Customer Segment

Residential and business customers

7.2 Charging

The served user shall be charged for the forwarded leg of the call.

History

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