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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the procedures used at the radio interface (reference point Um as defined in ETS 300 551) for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of Closed User Group (CUG) supplementary services within the European digital cellular telecommunications system (Phase 2).

This ETS corresponds to GSM technical specification, GSM 04.85 version 4.0.3.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules.

Reference is made within this ETS to GSM Technical Specifications (GSM-TS) (NOTE).

Reference is also made within this ETS to GSM 02.8x and 03.8x series. The specifications in the series can be identified, with their full title, within the normative reference Clause of this ETS by the last two digits of their GSM reference number e.g. GSM 03.8x series, refers to GSM 03.81, GSM 03.82, etc.

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TS). These TSs may have subsequently become I-ETSs (Phase 1), or ETSs (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in current GSM ETSs.

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0 General

0.1 Scope

This technical specification specifies the procedures used at the radio interface (reference point Um as defined in technical specification GSM 04.02) for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of community of interest supplementary services. The provision and withdrawal of supplementary services is an administrative matter between the mobile subscriber and the service provider and causes no signalling on the radio interface.

In technical specification GSM 04.10 the general aspects of the specification of supplementary services at the layer 3 radio interface are given.

Technical specifications GSM 04.80 specifies the formats coding for the supplementary services.

Definitions and descriptions of supplementary services are given in technical specifications GSM 02.04 and GSM 02.8x and GSM 02.9x-series. Technical specification GSM 02.85 is related to the community of interest supplementary services.

Technical realization of supplementary services is described in technical specifications GSM 03.11 and GSM 03.8x and 03.9x-series. Technical specification GSM 03.85 is related to the community of interest supplementary services.

The procedures for Call Control, Mobility Management and Radio Resource management at the layer 3 radio interface are defined in technical specifications GSM 04.07 and GSM 04.08.

Signalling interworking for supplementary services between TS GSM 09.02 and TS GSM 04.08 and between TS GSM 09.02 and TS GSM 04.80 is defined in TS GSM 09.11.

The following supplementary services belong to the community of interest supplementary services and are described in this technical specification:

- Closed User Group (CUG) section 1.

0.2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1] GSM 01.04 (ETR 100): "European digital cellular telecommunication system (Phase 2); "Abbreviations and acronyms".

[2] GSM 02.04 (ETS 300 503): "European digital cellular telecommunication system (Phase 2); General on supplementary services".

[3] GSM 02.81 (ETS 300 514): "European digital cellular telecommunication system (Phase 2); Line identification supplementary services - Stage 1".

[4] GSM 02.82 (ETS 300 515): "European digital cellular telecommunication system (Phase 2); Call Forwarding (CF) supplementary services - Stage 1".

[5] GSM 02.83 (ETS 300 516): "European digital cellular telecommunication system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[6] GSM 02.84 (ETS 300 517): "European digital cellular telecommunication system (Phase 2); Multi Party (MPTY) supplementary services - Stage 1".

[7] GSM 02.85 (ETS 300 518): "European digital cellular telecommunication system (Phase 2); Closed User Group (CUG) supplementary services - Stage 1".

[8] GSM 02.86 (ETS 300 519): "European digital cellular telecommunication system (Phase 2); Advice of charge (AoC) supplementary services - Stage 1".

[9] GSM 02.88 (ETS 300 520): "European digital cellular telecommunication system (Phase 2); Call Barring (CB) supplementary services - Stage 1".

[10] GSM 02.90 (ETS 300 521): "European digital cellular telecommunication system (Phase 2); Unstructured supplementary services operation - Stage 1".

[11] GSM 03.02 (ETS 300 522): "European digital cellular telecommunication system (Phase 2); Network architecture".

[12] GSM 03.11 (ETS 300 529): "European digital cellular telecommunication system (Phase 2); Technical realization of supplementary services".

[13] GSM 03.81 (ETS 300 542): "European digital cellular telecommunication system (Phase 2); Line identification supplementary services - Stage 2".

[14] GSM 03.82 (ETS 300 543): "European digital cellular telecommunication system (Phase 2); Call Forwarding (CF) supplementary services - Stage 2".

[15] GSM 03.83 (ETS 300 544): "European digital cellular telecommunication system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".

[16] GSM 03.84 (ETS 300 545): "European digital cellular telecommunication system (Phase 2); MultiParty (MPTY) supplementary services - Stage 2".

[17] GSM 03.85 (ETS 300 546): "European digital cellular telecommunication system (Phase 2); Closed User Group (CUG) supplementary services - Stage 2".

[18] GSM 03.86 (ETS 300 547): "European digital cellular telecommunication system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 2".

[19] GSM 03.88 (ETS 300 548): "European digital cellular telecommunication system (Phase 2); Call Barring (CB) supplementary services - Stage 2".

[20] GSM 03.90 (ETS 300 549): "European digital cellular telecommunication system (Phase 2); Unstructured supplementary services operation - Stage 2".

[21] GSM 04.02 (ETS 300 551): "European digital cellular telecommunication system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration".

[22] GSM 04.07 (ETS 300 556): "European digital cellular telecommunication system (Phase 2); Mobile radio interface signalling layer 3 General aspects".

[23] GSM 04.08 (ETS 300 557): "European digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 specification".

[24] GSM 04.10 (ETS 300 558): "European digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".

[25] GSM 04.80 (ETS 300 564): "European digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 supplementary services specification Formats and coding".

[26] GSM 09.02 (ETS 300 599): "European digital cellular telecommunication system (Phase 2); Mobile Application Part (MAP) specification".

[27] GSM 09.11 (ETS 300 606): "European digital cellular telecommunication system (Phase 2); Signalling interworking for supplementary services".

0.3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

1 Closed User Group (CUG)

1.1 Normal operation

1.1.1 Mobile originated CUG calls

1.1.1.1 Successful operation

CUG calls may be invoked Implicitly or Explicitly by the calling user.

In the case of Implicit invocation, no CUG information is provided by the user in the call set-up request and a default attribute of CUG is invoked. Normal call establishment procedures are followed over the radio interface and no CUG signalling is required.

In the case of Explicit CUG invocation, CUG information is provided by the user and is included in the SETUP message using the ForwardCUG-Info operation, see figure 1.1. User provided CUG information may consist of any combination of the following parameters:

- CUG Index;
- Suppress Preferential CUG indicator;
- Suppress OA indicator.

NOTE: No more than one of each parameter may be included per call attempt.

Figure 1.1: Transfer of CUG information during CUG call set-up

The network may optionally indicate to the MS that a CUG has been invoked for a call, see figure 1.2. When a CUG Index is received from the VLR the MSC shall send it immediately to the MS in a FACILITY or CALL PROCEEDING message.

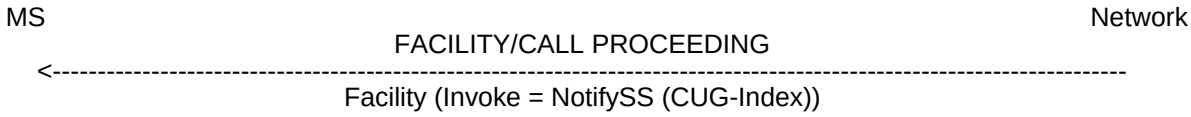

Figure 1.2: Indication of CUG invocation to the calling subscriber by the network

1.1.1.2 Unsuccessful operation

When an attempted CUG call is rejected for CUG related reasons, the mobile station is provided with an indication of the reason for failure.

The indication is passed to the calling MS in the first clearing message. The indication may be given in one of two ways:

- Diagnostics information in cause value #29 "Facility Rejected";
- A standard call control cause value.

Diagnostics are used when the rejection is generated locally (the serving VLR has rejected the call), or if they are provided in a cause value from a remote network node, see figure 1.3. Table 1.1 gives the diagnostics information for each potential local rejection case.

A CUG rejection from a remote network node is generally indicated using a standard (CUG related) call control cause value contained in an ISUP clearing message. These cause values are passed to the mobile station in the appropriate radio interface clearing message, see figure 1.4. Table 1.2 gives the cause values in each potential remote rejection case.

All CUG related call rejection cases are defined in TS GSM 03.85. Cause values are defined in TS GSM 04.08 and diagnostics in TS GSM 04.80.

NOTE: Annex A specifies the mapping of cause values between MAP, ISUP and TS GSM 04.08 for remotely generated CUG rejections.

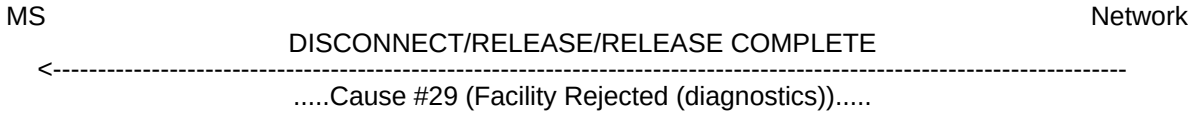

Figure 1.3: Indication of local CUG call rejection

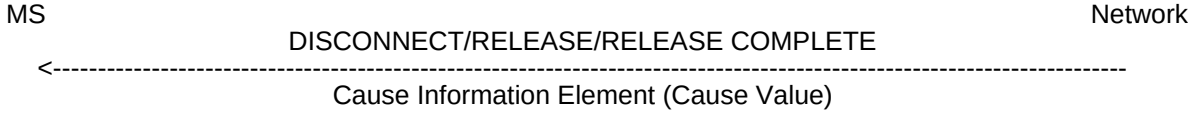

Figure 1.4: Indication of remote CUG call rejection

Reason for rejection See TS GSM 03.85	Facility Rejected #29 Diagnostic Field (Diagnostics)
Outgoing calls barred within the CUG	Outgoing calls barred within the CUG
Inconsistent access info - No CUG Selected	NO CUG Selected
Unknown CUG Index	Unknown CUG Index
Inconsistent access info - Index incompatible with requested basic service	Index incompatible with requested basic service

Table 1.1: Use of diagnostic values for local CUG call failure indications

Reason for rejection See TS GSM 03.85	Cause Information Element (Cause Value)
Called party supplementary service interaction violation	Facility Rejected #29 Diagnostic = CUG call failure, unspecified
Incompatible Destination NOTE	Facility Rejected #29 Diagnostic = CUG call failure, unspecified
Incoming calls barred within the CUG	Incoming calls barred within the CUG #55
Interlock mismatch	User not a member of CUG #87
Requested basic service violates CUG constraints	Facility Rejected #29

NOTE: In cases of interworking failures ETSI ISUP V2 clears the call with cause value #29 "Facility Rejected", Diagnostic = "Interlock Code". This is mapped to Facility Rejected with general diagnostic value "CUG call failure, unspecified" since the interlock code has no meaning for a mobile user.

Table 1.2: Use of cause values for remote CUG call failure indications

1.1.2 Mobile terminated calls

When a CUG call is terminated by a CUG subscriber the Index associated with the invoked CUG may be passed to the mobile station, see figure 1.5.

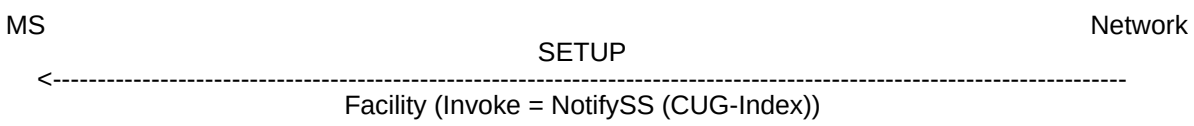

Figure 1.5: Presentation of the CUG Index to a CUG subscriber during reception of a CUG call

1.2 Activation, deactivation, interrogation, registration and erasure

Activation, deactivation, interrogation, registration and erasure of the supplementary service closed user group are not applicable.

Annex A (normative): CUG rejection cause value mapping

Table A.1 indicates how MAP, ISUP and TS GSM 04.08 cause values are mapped to enable a rejection indication to be passed from the remote rejecting node to the calling user.

GSM MAP CUG-RejectCause value	CCITT ISUP cause value	GSM 04.08 cause value
calledPartySupplementary-ServiceInteractionViolation	#29 Facility Rejected Diagnostic = IC NOTE 1	#29Facility Rejected Diagnostic= CUG call failure, unspecified
incomingCallsBarredWithinCUG	#55 I/C calls barred within CUG	#55 I/C calls barred within CUG
subscriberNotMemberOfCUG	#87 User not member of CUG	#87 User not member of CUG
requestedBasicService-ViolatesCUGConstraints	#29 Facility Rejected NOTE 2	#29Facility Rejected (no diagnostic)

NOTE 1: There is no specific cause value in ISUP for this rejection case. Therefore it is proposed that Cause Value #29 "Facility Rejected" is used with the diagnostic equal to the interlock of the call. This approach has been used in ISUP for interworking problems.

NOTE 2: There is no specific cause value in ISUP for this rejection case. It is therefore proposed to use cause value #29 "Facility Rejected" to indicate a general supplementary service failure.

Table A.1: Protocol mapping for CUG call rejection cause values

History

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