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**European digital cellular telecommunications system (Phase 2);
Advice of Charge (AoC) supplementary services - Stage 3
(GSM 04.86)**

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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 charging supplementary services within the European digital cellular telecommunications system (Phase 2).

This ETS corresponds to GSM technical specification, GSM 04.86 version 4.5.2.

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-ETTs (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 charging 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 specification GSM 04.80 specifies the formats and coding for the supplementary services.

Definitions and descriptions of supplementary services are given in technical specifications GSM 02.04 and GSM 02.8x and 02.9x-series. Technical specifications GSM 02.24 and 02.86 are related to the charging 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 03.86 is related to the charging 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.

The following supplementary services belong to the charging supplementary services and are described in this technical specification:

- Advice of Charge (Information) (AoCI) (section 1);
- Advice of Charge (Charging) (AoCC) (section 2).

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 telecommunications system (Phase 2); "Abbreviations and acronyms".
- [2] GSM 02.04 (ETS 300 503): "European digital cellular telecommunications system (Phase 2); General on supplementary services".
- [3] GSM 02.24 (ETS 300 510): "European digital cellular telecommunications system (Phase 2); Description of Charge Advice Information (CAI)".
- [4] GSM 02.81 (ETS 300 514): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 1".
- [5] GSM 02.82 (ETS 300 515): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 1".
- [6] GSM 02.83 (ETS 300 516): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

- [7] GSM 02.84 (ETS 300 517): "European digital cellular telecommunications system (Phase 2); Multi Party (MPY) supplementary services - Stage 1".
- [8] GSM 02.85 (ETS 300 518): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 1".
- [9] GSM 02.86 (ETS 300 519): "European digital cellular telecommunications system (Phase 2); Advice of charge (AoC) supplementary services - Stage 1".
- [10] GSM 02.88 (ETS 300 520): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 1".
- [11] GSM 02.90 (ETS 300 521): "European digital cellular telecommunications system (Phase 2); Unstructured supplementary services operation - Stage 1".
- [12] GSM 03.02 (ETS 300 522): "European digital cellular telecommunications system (Phase 2); Network architecture".
- [13] GSM 03.11 (ETS 300 529): "European digital cellular telecommunications system (Phase 2); Technical realization of supplementary services".
- [14] GSM 03.81 (ETS 300 542): "European digital cellular telecommunications system (Phase 2); Line identification supplementary services - Stage 2".
- [15] GSM 03.82 (ETS 300 543): "European digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services - Stage 2".
- [16] GSM 03.83 (ETS 300 544): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".
- [17] GSM 03.84 (ETS 300 545): "European digital cellular telecommunications system (Phase 2); Multi Party (MPY) supplementary services - Stage 2".
- [18] GSM 03.85 (ETS 300 546): "European digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services - Stage 2".
- [19] GSM 03.86 (ETS 300 547): "European digital cellular telecommunications system (Phase 2); Advice of Charge (AoC) supplementary services - Stage 2".
- [20] GSM 03.88 (ETS 300 548): "European digital cellular telecommunications system (Phase 2); Call Barring (CB) supplementary services - Stage 2".
- [21] GSM 03.90 (ETS 300 549): "European digital cellular telecommunications system (Phase 2); Unstructured supplementary services operation - Stage 2".
- [22] GSM 04.02 (ETS 300 551): "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [23] GSM 04.07 (ETS 300 556): "European digital cellular telecommunications system (Phase 2); Mobile radio interface signalling layer 3 General aspects".
- [24] GSM 04.08 (ETS 300 557): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".

- [25] GSM 04.10 (ETS 300 558): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".
- [26] GSM 04.80 (ETS 300 564): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 supplementary services specification Formats and coding".

0.3 Definitions and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

1 Advice of Charge (Information) (AoCI)

1.1 Normal operation with successful outcome

On every successful request for an applicable telecommunications service, the served mobile station will be provided with charging information.

The network sends the Charge Advice Information (CAI) to the mobile station according to technical specifications GSM 02.24, 02.86 and 03.86. With this information the mobile station is able to calculate the units associated with the requested service in real time. In the case where the served mobile is to be charged for multi party calls, separate processes within the mobile station are used to calculate units appropriate to each call. For unit calculation, each call is treated in the same way as a normal "two-party" call. Any change in the charging rate during a call may be indicated to the mobile station.

1.1.1 Call re-establishment

When the MS detects a radio link failure, the Chargeable Duration (CDUR) shall be suspended.

If a call re-establishment procedure is attempted, the MS shall resume the CDUR when:

- an MM connection has been successfully completed; and
- a TCH has been successfully seized in the appropriate mode.

1.1.2 MS originated call

For an MS originated call, charging information is transferred to the MS as shown in figure 1.1. The charging information is acknowledged in a FACILITY message only if the MS supports the AoCI functionality specified in TS GSM 02.24 and TS GSM 02.86. AoCI refers to the Advice of Charge (Information) service.

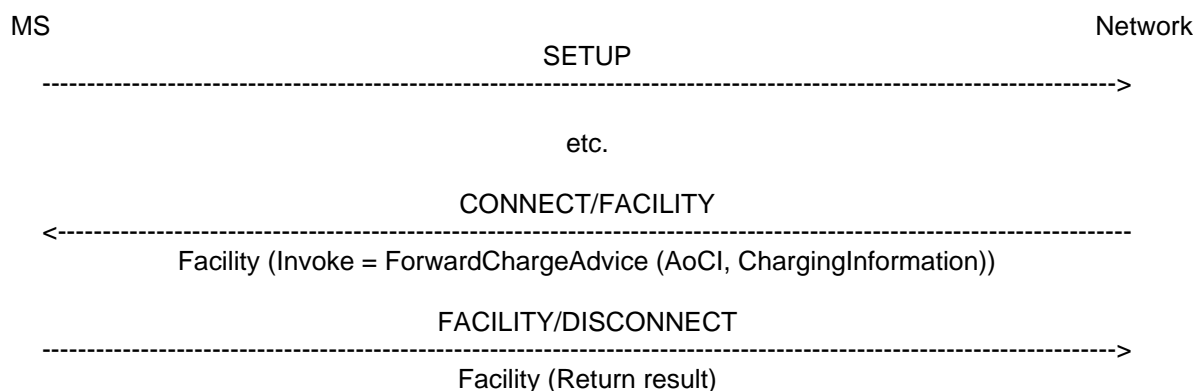


Figure 1.1: Notification to the served mobile subscriber of the charging information in case of an originated call set up

1.1.3 MS terminated call

For an MS terminated call, where required, charging information is transferred to the MS as shown in figure 1.2. The charging information is acknowledged only if the MS supports the AoCI functionality specified in TS GSM 02.24 and TS GSM 02.86.

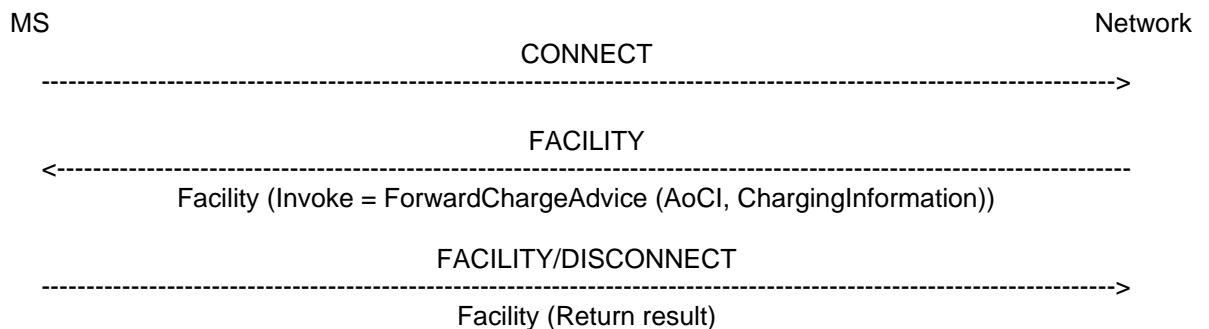


Figure 1.2: Notification to the served mobile subscriber of the charging information in case of a terminated call set up

1.1.4 Change of charging information

To inform the MS of a change in charging information the procedure of figure 1.3 is performed. The charging information is acknowledged only if the MS supports the AoCI functionality specified in TS GSM 02.24 and TS GSM 02.86.

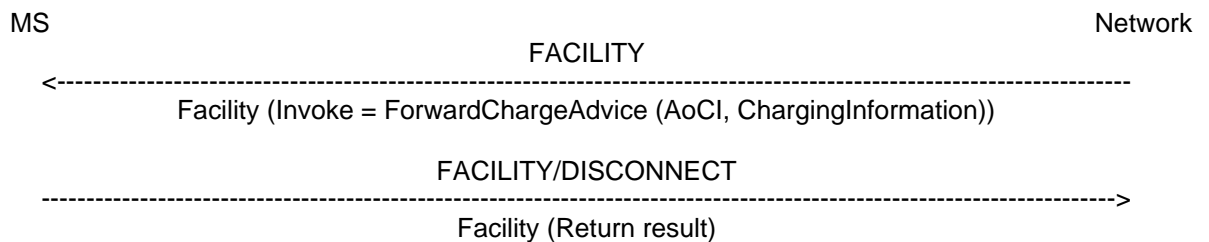


Figure 1.3: Notification to the served mobile subscriber of a change in the charging information

1.2 Normal operation with unsuccessful outcome

No signalling is performed by the network if a MS fails to acknowledge receipt of charging Information.

1.3 Activation, deactivation and invocation

Activation, deactivation and invocation of the Advice of Charge (Information) supplementary service are not applicable.

1.4 Interrogation, registration and erasure

Interrogation, registration and erasure of the Advice of Charge (Information) supplementary service are not applicable.

2 Advice of Charge (Charging) (AoCC)

2.1 Normal operation with successful outcome

On every successful request for an applicable telecommunications service, the served mobile station will be provided with charging information.

The network sends the Charge Advice Information (CAI) to the mobile station according to technical specifications GSM 02.24, 02.86 and 03.86. With this information the mobile station is able to calculate the units associated with the requested service in real time. In the case where the served mobile is to be charged for multi party calls, separate processes within the mobile station are used to calculate units appropriate to each call. For unit calculation, each call is treated in the same way as a normal "two-party" call. Any change in the charging rate during a call may be indicated to the mobile station.

2.1.1 Call re-establishment

When the MS detects a radio link failure, the Chargeable Duration (CDUR) shall be suspended.

If a call re-establishment procedure is attempted, the MS shall resume the CDUR when:

- an MM connection has been successfully completed; and
- a TCH has been successfully seized in the appropriate mode.

2.1.2 MS originated call

For an MS originated call, charging information is transferred to the MS as shown in figure 2.1. The charging information is acknowledged in a FACILITY message only if the MS supports the AoCC functionality specified in TS GSM 02.24 and TS GSM 02.86. AoCC refers to the Advice of Charge (Charging) service.

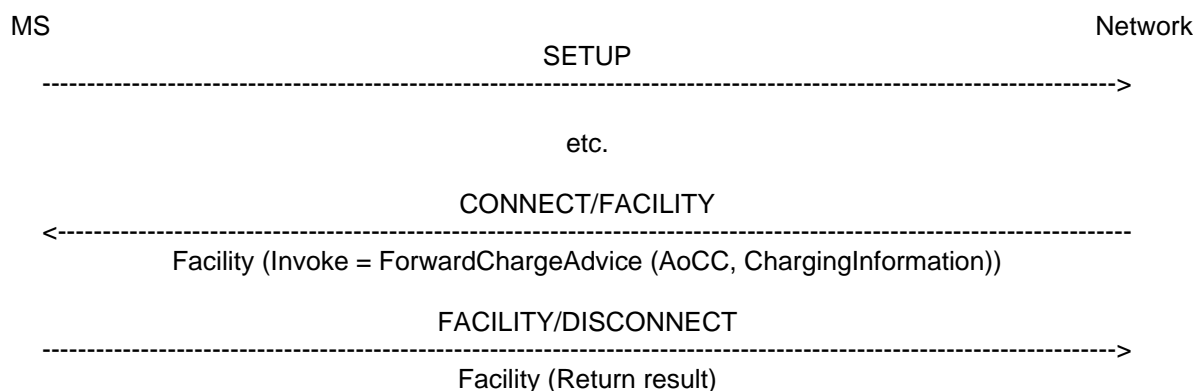


Figure 2.1: Notification to the served mobile subscriber of the charging information in case of an originated call set up

2.1.3 MS terminated call

For an MS terminated call, where required, charging information is transferred to the MS as shown in figure 2.2. The charging information is acknowledged only if the MS supports the AoCC functionality specified in TS GSM 02.24 and TS GSM 02.86.

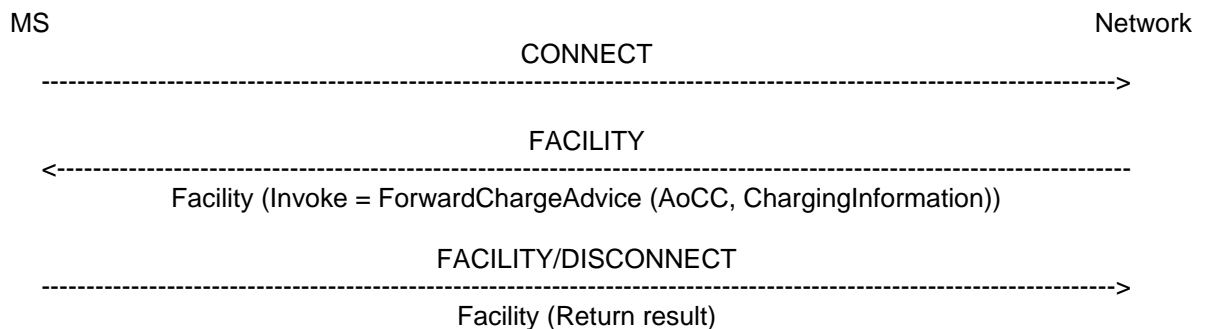


Figure 2.2: Notification to the served mobile subscriber of the charging information in case of a terminated call set up

2.1.4 Change of charging information

To inform the MS of a change in charging information the procedure of figure 2.3 is performed. The charging information is acknowledged only if the MS supports the AoCC functionality specified in TS GSM 02.24 and TS GSM 02.86.

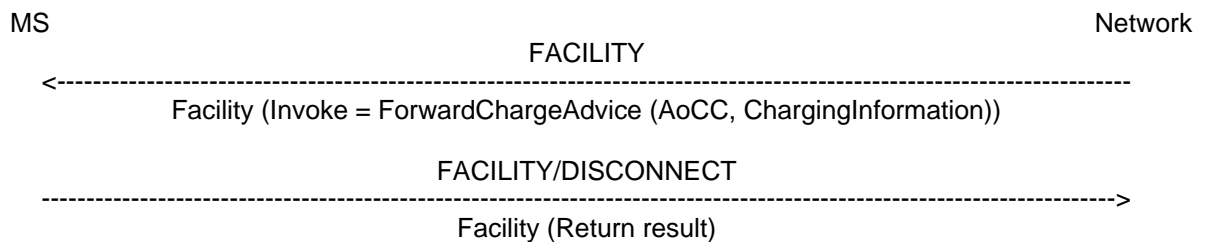


Figure 2.3: Notification to the served mobile subscriber of a change in the charging information

2.2 Normal operation with unsuccessful outcome

If timer T(AoC) (see TS GSM 03.86) expires before the Charge Advice Information is acknowledged, the network shall release the call. The mobile station and network shall act in accordance with TS GSM 04.08 network initiated call clearing procedures, see figure 2.4.

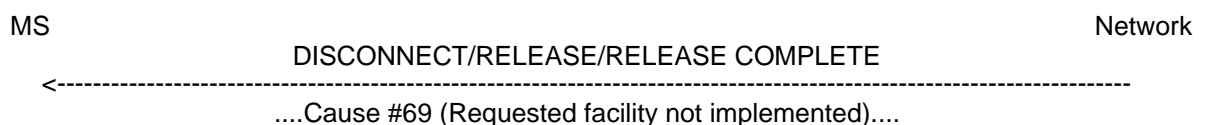


Figure 2.4: Network release due to unsuccessful operation of Advice of Charge (Charging) service

2.3 Accumulated Call Meter is equal to or greater than ACMmax

If the change stored in the Accumulated Call Meter (ACM) is equal to or greater than the maximum value specified by ACMmax, then the mobile station shall initiate call clearing giving a specific cause value for this situation as indicated in figure 2.5.

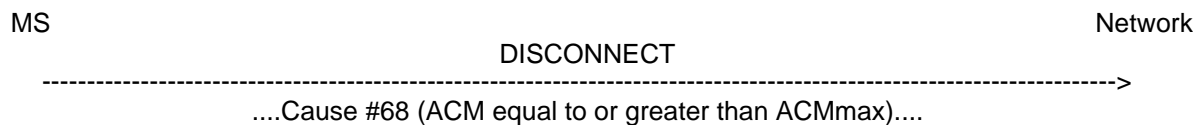


Figure 2.5: Mobile station releases the call due to ACM being equal to or greater than ACMmax

2.4 Activation, deactivation and invocation

Activation, deactivation and invocation of the Advice of Charge (Charging) supplementary service are not applicable.

2.5 Interrogation, registration and erasure

Interrogation, registration and erasure of the Advice of Charge (Charging) supplementary service are not applicable.

History

Document history	
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