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Technical Specification

**Digital cellular telecommunications system (Phase 2+) (GSM);
Universal Mobile Telecommunications System (UMTS);
Advice of Charge (AoC) supplementary services - Stage 3
(3G TS 24.086 version 3.0.0 Release 1999)**

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Foreword

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For GSM document identities of type "GSM xx.yy", e.g. GSM 01.04, the corresponding ETSI document identity may be found in the Cross Reference List on www.etsi.org/key

Contents

Foreword

This Technical Specification has been produced by the 3GPP.

This TS specifies the procedures used at the radio interface for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of charging supplementary services within the 3GPP system.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 Indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the specification;

0 Scope

The present document specifies the procedures used at the radio interface (reference point Um as defined in 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 GSM 04.10 the general aspects of the specification of supplementary services at the layer 3 radio interface are given.

GSM 04.80 specifies the formats and coding for the supplementary services.

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

Technical realization of supplementary services is described in GSM 03.11 and GSM 03.8x and GSM 03.9x-series. 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 GSM 04.07 and GSM 04.08.

The following supplementary services belong to the charging supplementary services and are described in the present document:

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

0.1 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] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] GSM 02.04: "Digital cellular telecommunications system (Phase 2+); General on supplementary services".

[3] GSM 02.24: "Digital cellular telecommunications system (Phase 2+); Description of Charge Advice Information (CAI)".

[4] GSM 02.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 1".

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

[6] GSM 02.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[7] GSM 02.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 1".

[8] GSM 02.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 1".

[9] GSM 02.86: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services - Stage 1".

[10] GSM 02.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 1".

[11] GSM 02.90: "Digital cellular telecommunications system (Phase 2+); Unstructured Supplementary Services Data (USSD) - Stage 1".

[12] GSM 03.02: "Digital cellular telecommunications system (Phase 2+); Network architecture".

[13] GSM 03.11: "Digital cellular telecommunications system (Phase 2+); Technical realization of supplementary services".

[14] GSM 03.81: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 2".

[15] GSM 03.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 2".

[16] GSM 03.83: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 2".

[17] GSM 03.84: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 2".

[18] GSM 03.85: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 2".

[19] GSM 03.86: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services - Stage 2".

[20] GSM 03.88: "Digital cellular telecommunications system (Phase 2+); Call Barring (CB) supplementary services - Stage 2".

[21] GSM 03.90: "Digital cellular telecommunications system (Phase 2+); Unstructured supplementary services operation - Stage 2".

[22] GSM 04.02: "Digital cellular telecommunications system (Phase 2+); GSM Public Land Mobile Network (PLMN) access reference configuration".

[23] GSM 04.07: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3; General aspects".

[24] GSM 04.08: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".

[25] GSM 04.10: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3; Supplementary services specification; General aspects".

[26] GSM 04.80: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 supplementary services specification; Formats and coding".

0.2 Abbreviations

Abbreviations used in the present document 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 (MS) will be provided with charging information.

The network sends the Charge Advice Information (CAI) to the MS according to GSM 02.24, GSM 02.86 and GSM 03.86. With this information the MS 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 MS 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 MS.

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 GSM 02.24 and GSM 02.86. AoCI refers to the Advice of Charge (Information) service.

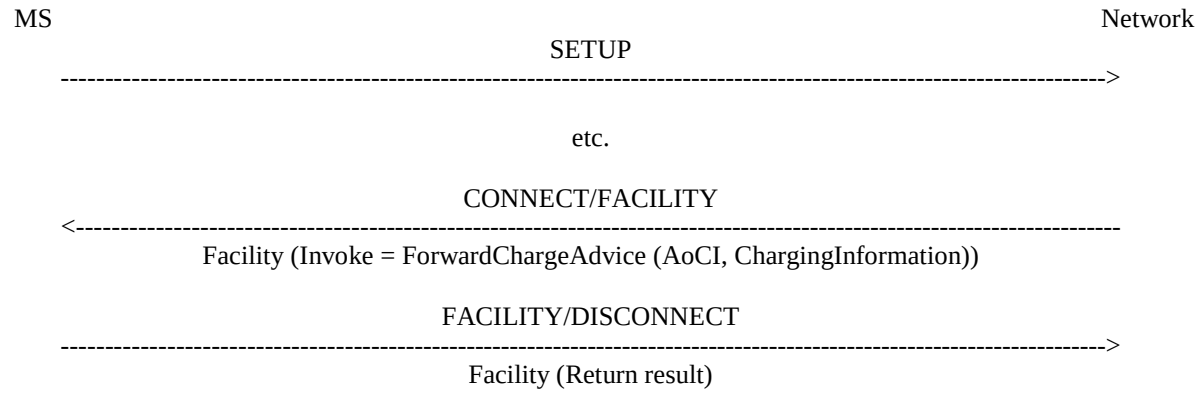

Figure 1.1: Notification to the served mobile subscriber of the charging information in case of an originated call set up

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 GSM 02.24 and GSM 02.86.

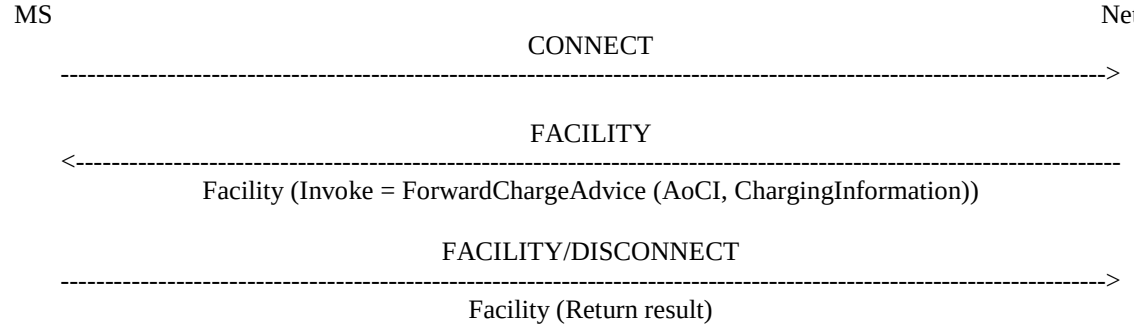

Figure 1.2: Notification to the served mobile subscriber of the charging information in case of a terminated call set-up

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 GSM 02.24 and GSM 02.86.

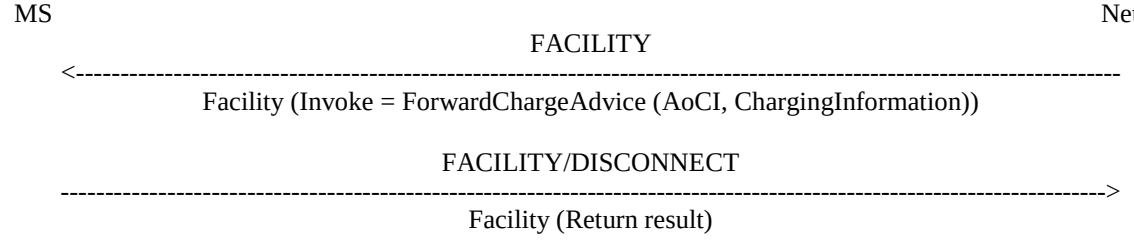

Figure 1.3: Notification to the served mobile subscriber of a change in the charging information

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 MS will be provided with charging information.

The network sends the Charge Advice Information (CAI) to the MS according to GSM 02.24, GSM 02.86 and GSM 03.86. With this information the MS 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 MS 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 MS.

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 GSM 02.24 and GSM 02.86. AoCC refers to the Advice of Charge (Charging) service.

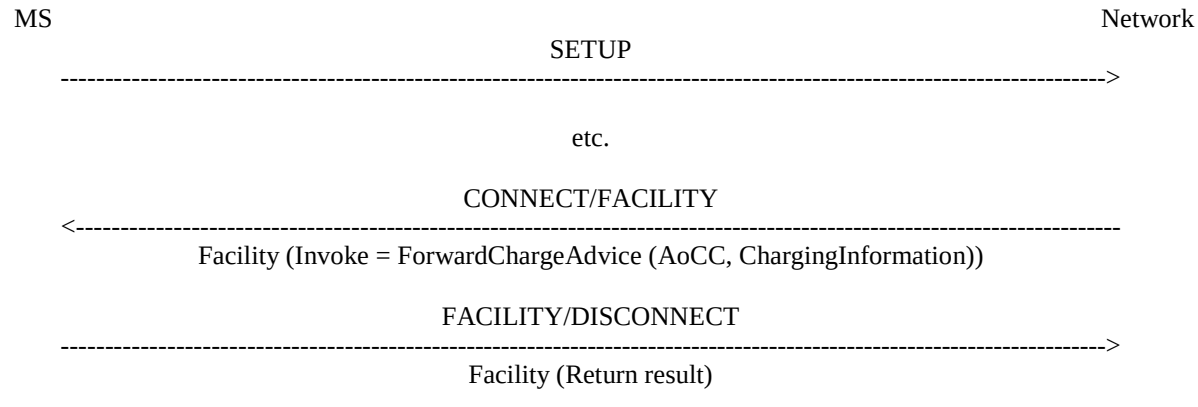

Figure 2.1: Notification to the served mobile subscriber of the charging information in case of an originated call set up

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 GSM 02.24 and GSM 02.86.

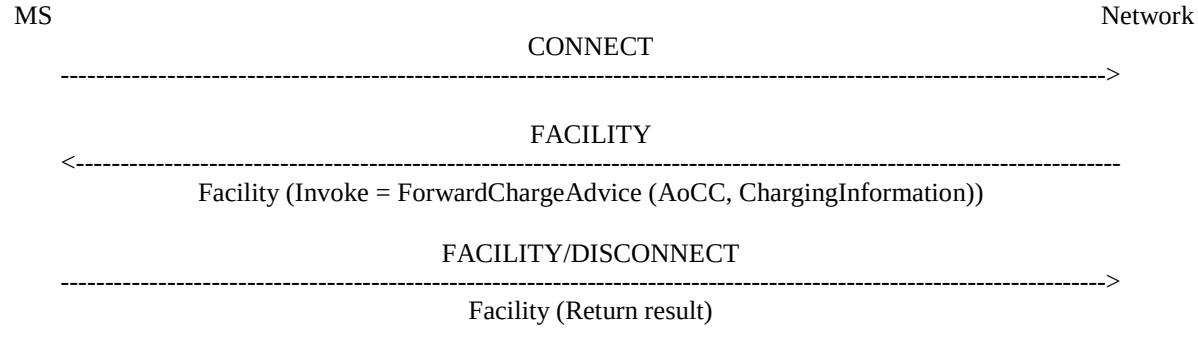

Figure 2.2: Notification to the served mobile subscriber of the charging information in case of a terminated call set up

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 GSM 02.24 and GSM 02.86.

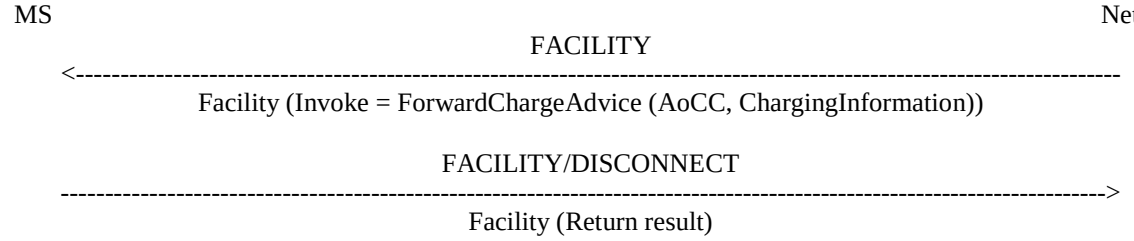

Figure 2.3: Notification to the served mobile subscriber of a change in the charging information

2.2 Normal operation with unsuccessful outcome

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

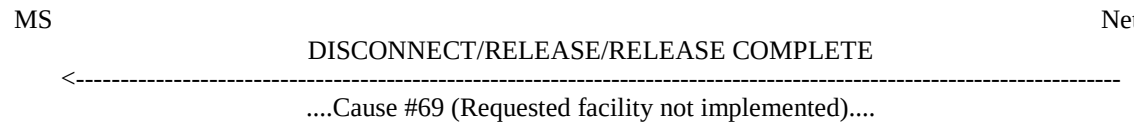

Figure 2.4: Network release due to unsuccessful operation of Advice of Charge (Charging) service

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 MS shall initiate call clearing giving a specific cause value for this situation as indicated in figure 2.5.

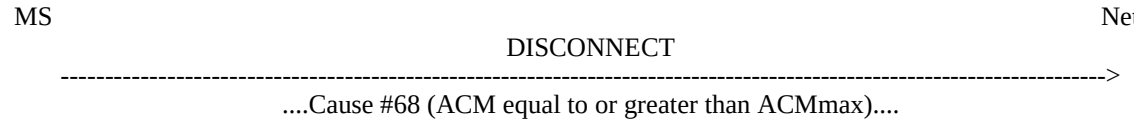

Figure 2.5: Mobile station releases the call due to ACM being equal to or greater than ACMmax

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.

Annex A:
Change history

Change history						
TSG CN#	**Spec**	**Version**	**CR**	**<Phase>**	**New Version**	**Subject/Comment**
Apr 1999	GSM 04.86	6.0.0				Transferred to 3GPP CN1
CN#03	24.086				3.0.0	Approved at CN#03

History

Document history		
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