

**3GPP TSG CN Plenary Meeting #20**  
**4<sup>th</sup> – 6<sup>th</sup> June 2003 Hämeenlinna, FINLAND.**

**NP-030221**

**Source:** TSG CN WG4  
**Title:** Corrections on MNP  
**Agenda item:** 8.8  
**Document for:** APPROVAL

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Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.066	023	1	N4-030710	Rel-5	IN-based solution for correct charging of calls to ported or non-portable subscribers originated by pre-paid subscribers	F	5.0.0

## CHANGE REQUEST

⌘ **23.066 CR 023** ⌘ rev **1** ⌘ Current version: **5.0.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

**Proposed change affects:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘	IN-based solution for correct charging of calls to ported or non-ported subscribers originated by pre-paid subscribers
<b>Source:</b>	⌘	CN4
<b>Work item code:</b>	⌘	MNP
		<b>Date:</b> ⌘ 22/05/2003
<b>Category:</b>	⌘	<b>F</b>
		<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Use <u>one</u> of the following categories:</p> <p><b>F</b> (correction)</p> <p><b>A</b> (corresponds to a correction in an earlier release)</p> <p><b>B</b> (addition of feature),</p> <p><b>C</b> (functional modification of feature)</p> <p><b>D</b> (editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a>.</p> </div> <div style="width: 45%;"> <p>Use <u>one</u> of the following releases:</p> <p><b>2</b> (GSM Phase 2)</p> <p><b>R96</b> (Release 1996)</p> <p><b>R97</b> (Release 1997)</p> <p><b>R98</b> (Release 1998)</p> <p><b>R99</b> (Release 1999)</p> <p><b>Rel-4</b> (Release 4)</p> <p><b>Rel-5</b> (Release 5)</p> <p><b>Rel-6</b> (Release 6)</p> </div> </div>

<b>Reason for change:</b>	⌘	A pre-paid subscriber may be charged with different rates depending on the porting status of the called subscriber.
<b>Summary of change:</b>	⌘	The option to use an IN-based query between gsmSCF and NPDB is added.
<b>Consequences if not approved:</b>	⌘	Pre-paid subscribers cannot be charged depending on the subscription network of the called party. Note that this CR resolves the problem only for PLMNs which have implemented the IN-based approach for MNP. To solve the problem for PLMNs which have implemented the SRF-based approach for MNP another CR is needed.

<b>Clauses affected:</b>	⌘	A.1.1, A.1.4.3 (new)				
<b>Other specs</b>	⌘	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> Other core specifications	Y	N	X	
Y	N					
X						
		⌘ 22.115 CR 012 (Rel 5) 22.115 CR 013 (Rel-6) 22.066 CR 005 (Rel-5) 22.066 CR 006 (Rel-6)				
<b>affected:</b>		<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px;"></td> <td style="width: 20px;">X</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> Test specifications O&M Specifications		X	X	
	X					
X						
<b>Other comments:</b>	⌘					

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision

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## A.1.1 Network Options

There are two IN-based solutions for querying the NPDB :-

- i. ETSI Core INAP
- ii. ANSI IN Query.

The following network operator options are defined for the MT calls in the GMSC:

- Terminating call Query on Digit Analysis (TQoD);
- Query on HLR Release (QoHR).

In a GSM network that supports the IN-based approach for call related MNP, each GMSC shall support at least one of these options.

The following network operator option is defined for MO calls in VMSCA and for forwarded calls in the GMSC and VMSCB:

- Originating call Query on Digit Analysis (OQoD).

In a GSM network which supports the IN-based approach for call related MNP, it is a network operator decision, taking into account the regulatory and architectural constraints that may prevail, whether or not VMSCs and GMSCs support this option.

The use of OQoD in transit switches in a PLMN while avoiding multiple database interrogations is for further study.

The interworking between the CCF and the SSF for MNP is for further study.

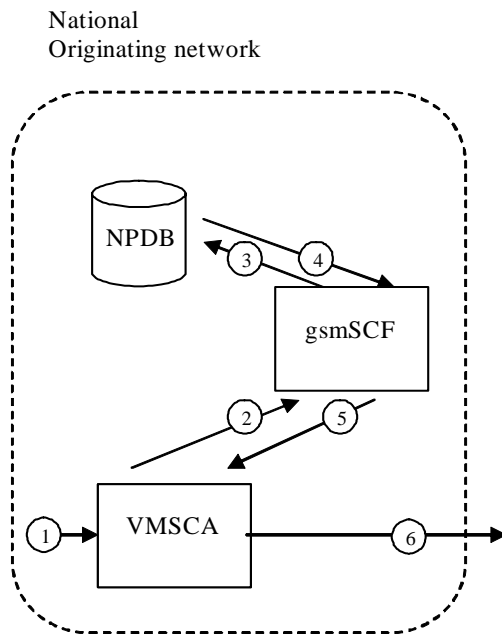
Note that for different number ranges different options may be chosen.

[An IN-based solution for querying the NPDB may also be used by the gsmSCF in order to be able to apply different charging tariffs for CAMEL pre-paid subscribers' calls or short messages established/sent when roaming in their home PLMN and directed to ported and non-portable mobile subscribers, depending on whether or not the called and the calling subscriber subscribe to the same PLMN.](#)

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### [A.1.4.3 IN-Query for CAMEL pre-paid service](#)

[Figure A.1.4.3 shows the architecture for a call or MO-Short-Message originated by a CAMEL pre-paid subscriber while roaming in the Home PLMN where the gsmSCF needs to know whether or not calling and called subscriber subscribe to the same PLMN in order to apply the correct charging tariff.](#)



**Figure A.1.4.3: IN-Query for pre-paid service**

- 1 A call or short message is initiated by Mobile Subscriber A towards Mobile Subscriber B, using the MSISDN of the called subscriber.
- 2 When VMSCA receives the call setup indication, it will send a CAP IDP message to the gsmSCF. The IDP contains the called party's MSISDN.
- 3 If the calling subscriber roams in her Home PLMN and the called subscriber's MSISDN indicates that the called subscriber subscribes to a PLMN within the calling subscriber's Home Country, the gsmSCF queries the NPDB based on the called party's MSISDN. Otherwise the tariff to be applied does not depend on the called subscriber's porting status and enough information to apply the correct tariff is available; go to 5.
- 4 The NPDB returns a routing number to the gsmSCF pointing out the called subscriber's subscription network. Based on this information the gsmSCF applies the appropriate tariff for pre-paid subscriber A.
- 5 The gsmSCF returns CAP AC and CAP CUE messages to the VMSCA.
- 6 The call or short message is set up.

Note that the NPDB and gsmSCF may be integrated within one physical entity.