

CR-Form v7

## CHANGE REQUEST

25.331 CR CRNum rev - Current version: 4.8.0

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>	Layer 3 filtering definition		
<b>Source:</b>	Nokia, Ericsson, NTT DoCoMo, Nortel Networks, Sony-Ericsson, NEC, TTPCom, Vodafone Group, Panasonic, Telia-Sonera, Fujitsu		
<b>Work item code:</b>	TEI4	<b>Date:</b>	11/03/2003
<b>Category:</b>	<b>F</b> Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		<b>Release:</b> Rel-4 Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

<b>Reason for change:</b>	At TSG RAN#17 in Biarritz, it was decided that RAN WG4 should study and propose a layer 3 filtering solution for later than rel-99 releases.  TSG RAN WG4 has been discussing this aspect in their meetings #25 and #26 and various contributions has been presented around the topic. The discussion has been on whether to apply logarithmic L3 filtering or linear L3 filtering.  Since no clear evidence that either of the two are strictly better from a performance point of view, but one solution is necessary in order to enable RRM optimizations, it is proposed to use logarithmic L3 filtering. Selecting Logarithmic filtering has the advantage that it simplifies the terminal implementation slightly.
<b>Summary of change:</b>	The remaining square brackets in the table of section 8.6.7.2 are removed, and logarithmic filtering shall be applied to all measurement quantities.
<b>Consequences if not approved:</b>	It remains unclear how the UE is filtering different measurement quantities, and hence event triggering is not possible to optimize. Network planning and RRM algorithms are not possible to optimize based on uniform terminal behaviour. As a consequence system performance is degraded due to larger SHO areas and higher amount of dropped calls.

<b>Clauses affected:</b>	8.6.7.2										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Y	N										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										

**Other comments:**



A long horizontal yellow bar, likely representing a redacted comment or a placeholder for text.

### 8.6.7.2 Filter coefficient

If the IE "Filter coefficient" is received the UE shall, depending on the measurement quantity (see Table 8.6.7.2), apply filtering of the measurements for that measurement quantity according to the formula below. This filtering shall be performed by the UE before UE event evaluation. The UE shall depending on the reporting quantity (see Table 8.6.7.2), also filter the measurements reported in the IE "Measured results". The filtering shall not be performed for the measurements reported in the IE "Measured results on RACH" and for cell-reselection in connected or idle mode.

The filtering shall be performed according to the following formula.

$$F_n = (1 - a) F_{n-1} + a M_n$$

The variables in the formula are defined as follows:

$F_n$  is the updated filtered measurement result

$F_{n-1}$  is the old filtered measurement result

$M_n$  is the latest received measurement result from physical layer measurements, the unit used for  $M_n$  is the same unit as the reported unit in the MEASUREMENT REPORT message or the unit used in the event evaluation.

$a = 1/2^{(k/2)}$ , where k is the parameter received in the IE "Filter coefficient".

NOTE: if k is set to 0 that will mean no layer 3 filtering.

In order to initialise the averaging filter,  $F_0$  is set to  $M_1$  when the first measurement result from the physical layer measurement is received.

The physical layer measurement results are sampled once every measurement period. The measurement period and the accuracy for a certain measurement is defined in [19] and [20].

Table 8.6.7.2 lists for all measurement quantities and reporting quantities if L3-filtering is applicable or not and used L3-filtering type for each measurement quantity. ~~If L3 filtering is applicable for a certain measurement quantity or reporting quantity, the table specifies if the UE shall apply the filtering on linear values ("Lin"), logarithmic values ("Log") or either linear or logarithmic values ("Lin or Log"). In the last case, the choice between filtering on linear or logarithmic values is based on UE selection.~~

**Table 8.6.7.2: L3 filtering applicable for each measurement quantity and reporting quantity**

Measurement- / Reporting quantity	L3-filtering applicable	Linear or logarithmic filtering	Comment
Pathloss	Yes	<del>Lin or</del> Log	
Cell synchronisation information	No	-	
Cell Identity	No	-	
Frequency quality estimate	No	-	Although the frequency quality estimate itself is not filtered, the inputs to the frequency quality estimate calculation (CPICH Ec/N0 or CPICH RSCP or P-CCPCH RSCP) are filtered
UTRA carrier RSSI	Yes	<del>+</del> Log	
GSM carrier RSSI	Yes	Log	
Observed time difference to GSM cell	No	-	
UE transmitted power	Yes	<del>+</del> Log	
FDD			
> UE Rx-Tx time difference	No	-	
> CPICH Ec/N0	Yes	<del>Lin or</del> Log	
> CPICH RSCP	Yes	<del>Lin or</del> Log	
TDD			
> Primary CCPCH RSCP	Yes	<del>Lin or</del> Log	

> Proposed TGSN	No	-	
> Timeslot ISCP	Yes	<del>Lin</del> -Log	
> TADV (1.28 Mcps TDD)	No	-	
> Applied TA (3.84 Mcps TDD)	No	-	

The UE shall support 2 different layer 3 filters per measurement type defined in subclause 8.4.0 (i.e. the UE shall be capable to apply at least 2 different L3 filters to intra-frequency measurement results, at least 2 different L3 filters to inter-frequency measurement results, etc.). If a MEASUREMENT CONTROL message is received that would require the UE to configure more than 2 different layer 3 filters, the UE may:

- 1> set the variable CONFIGURATION\_INCOMPLETE to TRUE.

<small>CR-Form v7</small>
<b>CHANGE REQUEST</b>
⌘ <b>25.331 CR CRNum</b> ⌘ rev <b>-</b> ⌘ Current version: <b>5.3.0</b> ⌘

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>	⌘ Layer 3 filtering definition		
<b>Source:</b>	⌘ Nokia, Ericsson, NTT DoCoMo, Nortel Networks, Sony-Ericsson, NEC, TTPCom, Vodafone Group, Panasonic, Telia-Sonera, Fujitsu		
<b>Work item code:</b>	⌘ TEI4	<b>Date:</b>	⌘ 11/03/2003
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)	

<b>Reason for change:</b>	⌘ At TSG RAN#17 in Biarritz, it was decided that RAN WG4 should study and propose a layer 3 filtering solution for later than rel-99 releases.  TSG RAN WG4 has been discussing this aspect in their meetings #25 and #26 and various contributions has been presented around the topic. The discussion has been on whether to apply logarithmic L3 filtering or linear L3 filtering.  Since no clear evidence that either of the two are strictly better from a performance point of view, but one solution is necessary in order to enable RRM optimizations, it is proposed to use logarithmic L3 filtering. Selecting Logarithmic filtering has the advantage that it simplifies the terminal implementation slightly.
<b>Summary of change:</b>	⌘ The remaining square brackets in the table of section 8.6.7.2 are removed, and logarithmic filtering shall be applied to all measurement quantities.
<b>Consequences if not approved:</b>	⌘ It remains unclear how the UE is filtering different measurement quantities, and hence event triggering is not possible to optimize. Network planning and RRM algorithms are not possible to optimized based on uniform terminal behaviour. As a consequence system performance is degraded due larger SHO areas and higher amount of dropped calls.

<b>Clauses affected:</b>	⌘ 8.6.7.2										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	⌘	X	⌘	X	⌘	X	⌘	
Y	N										
⌘	X										
⌘	X										
⌘	X										

**Other comments:**



A long horizontal yellow bar, likely representing a redacted comment or a placeholder for text.

### 8.6.7.2 Filter coefficient

If the IE "Filter coefficient" is received the UE shall, depending on the measurement quantity (see Table 8.6.7.2), apply filtering of the measurements for that measurement quantity according to the formula below. This filtering shall be performed by the UE before UE event evaluation. The UE shall depending on the reporting quantity (see Table 8.6.7.2), also filter the measurements reported in the IE "Measured results". The filtering shall not be performed for the measurements reported in the IE "Measured results on RACH" and for cell-reselection in connected or idle mode.

The filtering shall be performed according to the following formula.

$$F_n = (1 - a) F_{n-1} + a M_n$$

The variables in the formula are defined as follows:

$F_n$  is the updated filtered measurement result

$F_{n-1}$  is the old filtered measurement result

$M_n$  is the latest received measurement result from physical layer measurements, the unit used for  $M_n$  is the same unit as the reported unit in the MEASUREMENT REPORT message or the unit used in the event evaluation.

$a = 1/2^{(k/2)}$ , where k is the parameter received in the IE "Filter coefficient".

NOTE: if k is set to 0 that will mean no layer 3 filtering.

In order to initialise the averaging filter,  $F_0$  is set to  $M_1$  when the first measurement result from the physical layer measurement is received.

The physical layer measurement results are sampled once every measurement period. The measurement period and the accuracy for a certain measurement is defined in [19] and [20].

Table 8.6.7.2 lists for all measurement quantities and reporting quantities if L3-filtering is applicable or not and used L3-filtering type for each measurement quantity. ~~If L3 filtering is applicable for a certain measurement quantity or reporting quantity, the table specifies if the UE shall apply the filtering on linear values ("Lin"), logarithmic values ("Log") or either linear or logarithmic values ("Lin or Log"). In the last case, the choice between filtering on linear or logarithmic values is based on UE selection.~~

**Table 8.6.7.2: L3 filtering applicable for each measurement quantity and reporting quantity**

Measurement- / Reporting quantity	L3-filtering applicable	Linear or logarithmic filtering	Comment
Pathloss	Yes	<del>Lin or</del> Log	
Cell synchronisation information	No	-	
Cell Identity	No	-	
Frequency quality estimate	No	-	Although the frequency quality estimate itself is not filtered, the inputs to the frequency quality estimate calculation (CPICH Ec/N0 or CPICH RSCP or P-CCPCH RSCP) are filtered
UTRA carrier RSSI	Yes	<del>Log</del>	
GSM carrier RSSI	Yes	Log	
Observed time difference to GSM cell	No	-	
UE transmitted power	Yes	<del>Log</del>	
FDD			
> UE Rx-Tx time difference	No	-	
> CPICH Ec/N0	Yes	<del>Lin or</del> Log	
> CPICH RSCP	Yes	<del>Lin or</del> Log	
TDD			
> Primary CCPCH RSCP	Yes	<del>Lin or</del> Log	

> Proposed TGSN	No	-	
> Timeslot ISCP	Yes	<del>Lin</del> -Log	
> TADV (1.28 Mcps TDD)	No	-	
> Applied TA (3.84 Mcps TDD)	No	-	

The UE shall support 2 different layer 3 filters per measurement type defined in subclause 8.4.0 (i.e. the UE shall be capable to apply at least 2 different L3 filters to intra-frequency measurement results, at least 2 different L3 filters to inter-frequency measurement results, etc.). If a MEASUREMENT CONTROL message is received that would require the UE to configure more than 2 different layer 3 filters, the UE may:

- 1> set the variable CONFIGURATION\_INCOMPLETE to TRUE.