**3GPP TSG-CT WG1 Meeting #124-eC1-203636**

**Electronic meeting, 2-10 June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **27.007** | **CR** | **0695** | **rev** | **-** | **Current version:** | **16.4.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | Removing the ENs for the enhancement to 5G Location Serivces | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | CATT | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_eLCS | | | | |  | ***Date:*** | | | 2020-05-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | There are seveal editor’s notes on the potential update to existing AT Commands for Location Services. But current AT Commands for Location Services can be reused to support 5G Location Services tesing. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Remove the relevant FFSs related to enhancement of 5G LCS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The exiting editor’s notes for the enhancement of 5G LCS are misleading. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.50, 8.55, 8.56, 8.57 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\*Start of change \*\*\*\*\*

## 8.50 Mobile originated location request +CMOLR

Table 8.50-1: +CMOLR parameter command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CMOLR=[<enable>[,<method>[,<hor-acc-set>[,<hor-acc>[,<ver-req>[,<ver-acc-set>[,<ver-acc>[,<vel-req>[,<rep-mode>[,<timeout>[,<interval>[,<shape-rep>[,<plane>[,<NMEA-rep>[,<third-party-address>]]]]]]]]]]]]]]]] | *+CME ERROR: <err>* |
| +CMOLR? | +CMOLR: <enable>,<method>,<hor-acc-set>,[<hor-acc>],<ver-req>,[<ver-acc-set>],[<ver-acc>],<vel-req>,<rep-mode>,<timeout>,[<interval>],<shape-rep>,[<plane>],[<NMEA-rep>],[<third-party-address>]  *+CME ERROR: <err>* |
| +CMOLR=? | +CMOLR: (list of supported <enable>s),(list of supported <method>s),(list of supported <hor-acc-set>s),(list of supported <hor-acc>s),(list of supported <ver-req>s),(list of supported <ver-acc-set>s),(list of supported <ver-acc>s),(list of supported <vel-req>s),(list of supported <rep-mode>s),(list of supported <timeout>s),(list of supported <interval>s),(list of supported <shape-rep>s),(list of supported <plane>s),(list of supported <NMEA-rep>s),(list of supported <third-party-address>s) |

**Description**

Set command initiates a mobile originated location request (MO-LR). The parameter <enable> enables or disables positioning and reporting by unsolicited result codes. Reporting can be performed in the format of GAD shapes <location\_parameters> or in the format of NMEA strings <NMEA-string> or both. The unsolicited result codes that can be provided are +CMOLRG: <location\_parameters> and/or +CMOLRN: <NMEA-string>.

The method to use for positioning is decided by the parameter <method>. The parameters <hor-acc-set>, <hor-acc>, <ver-req>, <ver-acc-set>, <ver-acc> and <vel-req> indicate accuracy for the MO-LR. The parameter <timeout> indicates how long the MS will wait for a report before an unsolicited result code is provided. A single report or periodic reports can be requested by the parameter <rep-mode>. If periodic reports are requested, the time interval between the reports is specified by the parameter <interval>. If GAD shapes are requested, the GAD shapes that will be accepted in the unsolicited result code +CMOLRG: <location\_parameters> are defined by the parameter <shape-rep>. The parameter <plane> specifies the signalling to use for MO-LR. The parameter <NMEA-rep> indicates possible restrictions in supported NMEA strings that will be accepted in the unsolicited result code +CMOLRN: <NMEA-string>. The parameter <third-party-address> is used to specify the address when reporting to a third party is specified. Additional information about positioning can be found in 3GPP TS 25.305 [77]. If positioning-data cannot be provided at a timeout, the unsolicited result +CMOLRE is provided. Refer subclause 9.2 and subclause 9.3 for possible <err> values.

Read command returns the current settings of the parameters <enable>, <method>, <hor-acc-set>, <hor-acc>, <ver-req>, <ver-acc-set>, <ver-acc>, <vel-req>, <rep-mode>, <timeout>, <interval> <shape-rep>, <plane>, <NMEA-rep> and <third-party-address>. The parameters <hor-acc>, <ver-acc-set>, <ver-acc> and <plane> are only applicable in certain configurations. The parameter <interval> is only applicable if periodic reporting is specified. The parameter <NMEA-rep> is only applicable if reporting is specified by NMEA strings. The parameter <third-party-address> is only applicable if reporting to third party is specified.

There is no enhancement for location services in 5G that impacts the AT command.

Test command returns the supported values and ranges.

**Defined values**

<enable>: integer type. Enables and disables reporting location as a result of a MO-LR. Only one <method> can be enabled at any given time.

0 Disables reporting and positioning.

1 Enables reporting of NMEA strings by unsolicited result code +CMOLRN: <NMEA-string>.  
Lack of data at each timeout is indicated by an unsolicited result code +CMOLRE.

2 Enables reporting of GAD shapes by unsolicited result code +CMOLRG: <location\_parameters>.  
Lack of data at each timeout is indicated by an unsolicited result code +CMOLRE.

3 Enables reporting of NMEA strings and GAD shapes by unsolicited result codes  
+CMOLRG: <location\_parameters> and +CMOLRN: <NMEA-string>.  
Lack of data at each timeout is indicated by an unsolicited result code +CMOLRE.

NOTE 1: The string of <location\_parameters> intended for +CMOLR can be split into multiple unsolicited result codes e.g. in order to prevent that the string in the unsolicited result code becomes too long. How to split the string is implementation specific.

<method>: integer type. Method for MO-LR. The default value is implementation specific.

0 Unassisted GPS. Autonomous GPS only, no use of assistance data.

1 Assisted GPS (see NOTE 2).

2 Assisted GANSS (see NOTE 2).

3 Assisted GPS and GANSS (see NOTE 2).

4 Basic self location (the network determines the position technology).

5 Transfer to third party. This method makes the parameters <shape-rep> and <NMEA-rep> irrelevant (any values are accepted and disregarded). The third party address is given in the parameter <third-party-address> (see NOTE 3).

6 Retrieval from third party. This method is to get the position estimate of the third party. The third party address is given in the parameter <third-party-address>.

NOTE 2: For the methods that require assistance data, the assistance data obtained from the network is used for a UE-based GPS location procedure.

NOTE 3: Lack of data at each timeout is not indicated by an unsolicited result code +CMOLRE if reporting to third party is specified.

<hor-acc-set>: integer type.

0 Horisontal accuracy not set/specified.

1 Horizontal accuracy set in parameter <hor-acc>.

<hor-acc>: integer type. Requested accuracy as horizontal uncertainty exponent (refer to 3GPP TS 23.032 [76] subclause 6.2). The value range is 0-127. The default value is implementation specific.

<ver-req>: integer type.

0 Vertical coordinate (altitude) is not requested, 2D location fix is acceptable. The parameters <ver-acc-set> and <ver-acc> do not apply.

1 Vertical coordinate (altitude) is requested, 3D location fix is required.

<ver-acc-set>: integer type.

0 Vertical accuracy not set/specified.

1 Vertical accuracy set/specified in parameter <ver-acc>.

<ver-acc>: integer type. Requested accuracy as vertical uncertainty exponent (refer to 3GPP TS 23.032 [76] subclause 6.4). The value range is 0-127. The default value is implementation specific.

<vel-req>: integer type. Requested velocity type (refer to 3GPP TS 23.032 [76] subclause 8.6).

0 Velocity not requested.

1 Horizontal velocity requested.

2 Horizontal velocity and vertical velocity requested.

3 Horizontal velocity with uncertainty requested.

4 Horizontal velocity with uncertainty and vertical velocity with uncertainty requested.

<rep-mode>: integer type. Reporting mode. The default value is implementation specific.

0 Single report, the timeout for the MO-LR response request is specified by <timeout>.

1 Periodic reporting, the timeout for each MO-LR response request is specified by <timeout> and the interval between each MO-LR is specified by <interval>.

<timeout>: integer type. Indicates how long the MS will wait for a response after a MO-LR. The value range is in seconds from 1 to 65535. The default value is implementation specific.

<interval>: integer type. The parameter is applicable to periodic reporting only. Determine the interval between periodic MO-LRs. The value range is in seconds from 1 to 65535, and must be greater than or equal to <timeout>. The default value is implementation specific.

<shape-rep>: integer type. This parameter is a sum of integers each representing a certain GAD shape that will be accepted in the unsolicited result code +CMOLRG: <location\_parameters>. Note that only one GAD shape is present per unsolicited result code. The default value is implementation specific.

1 Ellipsoid point.

2 Ellipsoid point with uncertainty circle.

4 Ellipsoid point with uncertainty ellipse.

8 Polygon.

16 Ellipsoid point with altitude.

32 Ellipsoid point with altitude and uncertainty ellipsoid.

64 Ellipsoid arc.

<plane>: integer type. The parameter specifies whether the control plane or SUPL will be used for MO-LR.

0 Control plane.

1 Secure user plane (SUPL).

<NMEA-rep>: string type. The supported NMEA strings that will be accepted in the unsolicited result code +CMOLRN: <NMEA-string> are specified as a comma separated values inside one string. If the parameter is omitted or an empty string is given, no restrictions apply and all NMEA strings are supported. The default value is that all strings are supported.

Example of NMEA strings: "$GPRMC,$GPGSA,$GPGSV"

<third-party-address>: string type. The parameter is applicable to reporting to third party only, and specifies the address to the third party. This parameter has to be specified when <method> value is set to 5 or 6.

<location\_parameters>: string type in UTF-8. This parameter provides XML-formatted strings of GAD-shape positioning data as defined in table 8.50-2. This parameter shall not be subject to conventional character conversion as per +CSCS. The XML according to the DTD in table 8.50-2 may be provided in one or multiple unsolicited result codes.

Table 8.50-2: XML DTD for <location\_parameters>

<?xml version="1.0" ?>

<!DOCTYPE location\_parameters [

<!ELEMENT location\_parameters (time?,direction?,shape\_data,velocity\_data?)>

   <!ELEMENT time (#PCDATA)>

   <!ELEMENT direction (#PCDATA)>

   <!ELEMENT shape\_data (ellipsoid\_point|ellipsoid\_point\_uncert\_circle|ellipsoid\_point\_uncert\_ellipse|polygon|ellipsoid\_point\_alt|ellipsoid\_point\_alt\_uncertellipse|ellips\_arc)>

      <!ELEMENT ellipsoid\_point (coordinate)>

         <!ELEMENT coordinate (latitude,longitude)>

            <!ELEMENT latitude (north,degrees)>

               <!ELEMENT north (#PCDATA)>

               <!ELEMENT degrees (#PCDATA)>

            <!ELEMENT longitude (#PCDATA)>

      <!ELEMENT ellipsoid\_point\_uncert\_circle (coordinate,uncert\_circle)>

         <!ELEMENT uncert\_circle (#PCDATA)>

      <!ELEMENT ellipsoid\_point\_uncert\_ellipse (coordinate,uncert\_ellipse)>

         <!ELEMENT uncert\_ellipse (uncert\_semi\_major,uncert\_semi\_minor,orient\_major,confidence)>

            <!ELEMENT uncert\_semi\_major (#PCDATA)>

            <!ELEMENT uncert\_semi\_minor (#PCDATA)>

            <!ELEMENT orient\_major (#PCDATA)>

            <!ELEMENT confidence (#PCDATA)>

      <!ELEMENT polygon (coordinate+)>

      <!ELEMENT ellipsoid\_point\_alt (coordinate,altitude)>

         <!ELEMENT altitude (height\_above\_surface,height)>

            <!ELEMENT height\_above\_surface (#PCDATA)>

            <!ELEMENT height (#PCDATA)>

      <!ELEMENT ellipsoid\_point\_alt\_uncertellipse (coordinate,altitude,uncert\_semi\_major,uncert\_semi\_minor,orient\_major,confidence,uncert\_alt)>

         <!ELEMENT uncert\_alt (#PCDATA)>

      <!ELEMENT ellips\_arc (coordinate,inner\_rad,uncert\_rad,offset\_angle,included\_angle,confidence)>

         <!ELEMENT inner\_rad (#PCDATA)>

         <!ELEMENT uncert\_rad (#PCDATA)>

         <!ELEMENT offset\_angle (#PCDATA)>

         <!ELEMENT included\_angle (#PCDATA)>

   <!ELEMENT velocity\_data

(hor\_velocity?,vert\_velocity?,vert\_velocity\_direction?,hor\_uncert?,vert\_uncert?)>

      <!ELEMENT hor\_velocity (#PCDATA)>

      <!ELEMENT vert\_velocity (#PCDATA)>

      <!ELEMENT vert\_velocity\_direction (#PCDATA)>

      <!ELEMENT hor\_uncert (#PCDATA)>

      <!ELEMENT vert\_uncert (#PCDATA)>

]>

<NMEA-string>: string type in UTF-8. This parameter provides an NMEA-string as defined in IEC 61162 [78]. This parameter shall not be subject to conventional character conversion as per +CSCS.

Example:+CMOLRN: "$GPRMC,235947.000,V,0000.0000,N,00000.0000,E,,,041299,,\*1D<CR><LF>&"

**Implementation**

Optional.

\*\*\*\*\* Next change \*\*\*\*\*

## 8.55 Positioning control +CPOS

Table 8.55-1: +CPOS Action Command Syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CPOS<CR>  text is entered <ctrl-Z/ESC> | *+CME ERROR: <err>* |
| +CPOS=? |  |

**Description**

Execution command causes the TE to enter a transparent mode for sending XML formatted data according to table 8.55-2: XML DTD for <pos>.

Subsequent to +CPOS:

- the TA shall send a two character sequence <CR><LF> after command line is terminated with <CR>. Then text can be entered from TE to ME/TA.

- the echoing of entered characters back from the TA is controlled by V.25ter echo command E.

- sending may be cancelled by giving <ESC> character (IRA 27).

- <ctrl-Z> (IRA 26) shall be used to indicate the ending of the message body.

There is no enhancement for location services in 5G that impacts the AT command. Refer subclause 9.2 for possible <err> values.

**Defined events**

<location>: string type in UTF-8. This parameter provides an XML-formatted string of GAD-shape positioning data similar to what is defined in table 8.55-3. This parameter shall not be subject to conventional character conversion as per +CSCS.

<assist\_data>: string type in UTF-8. This parameter provides an XML-formatted string of assistance data as defined in table 8.55-5. This parameter shall not be subject to conventional character conversion as per +CSCS.

<GPS\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of GPS measurement data as defined in table 8.55-10. This parameter shall not be subject to conventional character conversion as per +CSCS.

<GNSS\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of GPS measurement data as defined in table 8.55-11 for LPP procedures and GANSS procedures in RRLP and RRC. This parameter shall not be subject to conventional character conversion as per +CSCS.

<GPS\_assist\_req>: string type in UTF-8. This parameter provides an XML-formatted string for requesting GPS assistance data as defined in table 8.55-12. This parameter shall not be subject to conventional character conversion as per +CSCS.

<Strobe>: string type in UTF-8. This parameter provides an XML-formatted string for triggering the generation of strobe as defined in table 8.55-25. This parameter shall not be subject to conventional character conversion as per +CSCS.

<GNSS\_assist\_req>: string type in UTF-8. This parameter provides an XML-formatted string for requesting GNSS assistance data as defined in table 8.55-15. This parameter shall not be subject to conventional character conversion as per +CSCS.

<capability\_req> string type in UTF-8. This parameter provides an XML-formatted string for requesting capability data as defined in table 8.55-4. This parameter shall not be subject to conventional character conversion as per +CSCS.

<msg>: string type in UTF-8. This parameter provides an XML-formatted string for communicating simple messages as defined in table 8.55-13. This parameter shall not be subject to conventional character conversion as per +CSCS.

<pos\_err>: string type in UTF-8. This parameter provides an XML-formatted string of positioning error parameters as defined in table 8.55-14. This parameter shall not be subject to conventional character conversion as per +CSCS.

<reset\_assist\_data>: string type in UTF-8. This parameter provides an XML-formatted string for resetting GNSS/OTDOA/Sensor/TBS assistance data as defined in table 8.55-22. This parameter shall not be subject to conventional character conversion as per +CSCS.

<OTDOA\_ECID\_req>: string type in UTF-8. This parameter provides an XML-formatted string for aborting/requesting location information for OTDOA/ECID method types as defined in table 8.55-23. This parameter shall not be subject to conventional character conversion as per +CSCS.

NOTE 1: An XML-formatted string intended for +CPOS can be split e.g. in order to prevent that the string becomes too long. Where to split an XML-formatted string is implementation specific.

<GNSS\_provided\_location\_information>: string type in UTF-8. This parameter provides an XML-formatted string of GAD-shape positioning data as defined in table 8.55-19. This parameter shall not be subject to conventional character conversion as per +CSCS.

<Add\_pos\_req>: string type in UTF-8. This parameter provides an XML-formatted string for aborting/requesting location information for Additional Positioning method types (Bluetooth/Sensor/TBS/WLAN) as defined in table 8.55-2. This parameter shall not be subject to conventional character conversion as per +CSCS.

Table 8.55-2: XML DTD for <pos>

<?xml version="1.0" ?>

<!DOCTYPE pos[

<!ELEMENT pos (location|GNSS\_provided\_location\_information|assist\_data|pos\_meas|pos\_meas\_req|GPS\_meas|OTDOA\_ECID\_req|Add\_pos\_req|OTDOA\_meas|ECID\_meas|GNSS\_meas|Bluetooth\_meas|Sensor\_meas|TBS\_meas|WLAN\_meas|GPS\_assist\_req|GNSS\_assist\_req|OTDOA\_assist\_req|Sensor\_assist\_req|TBS\_assist\_req|capability\_req|capabilities|msg|pos\_err|reset\_assist\_data|Strobe)>

   <!ATTLIST pos protocol (RRLP|RRC|LPP) #IMPLIED

   transaction\_id CDATA #IMPLIED>

]>

NOTE 2: The XML DTD for ‘pos’ is the top-level definition of all positioning events, containing elements going in both directions between the MS and the network. The subelements of ‘pos’ are superset definitions of the positioning events. A variable amount of these elements can be sent. Sent elements must follow the rules for the XML, e.g. elements postfixed by ‘?’ can occur zero or more times. The total delivery must be a complete specification. Sub-elements cannot be delivered without being preceeded with an element reference from the above level.

Table 8.55-3: XML DTD for <location>

<!ELEMENT location (location\_parameters,time\_of\_fix?,time\_assistance?)>

   <!ELEMENT time\_of\_fix (#PCDATA)>

   <!ELEMENT time\_assistance (GPS\_time,(GSM\_time|WCDMA\_time|LTE\_time)?,TimeUnc?)>

NOTE 3: The element ‘location\_parameters’ provides one or more XML-formatted strings of GAD-shape positioning data as defined in table 8.50-2.

NOTE 3a: The elements ‘time\_of\_fix’ of ‘location’ and ‘time’ of ‘location\_parameters’ (see Table 8.50-2) are both for holding time-stamp of the location information. Due to this, the parameter ‘time\_of\_fix’ can be omitted when ‘time’ is present or vice versa.

Table 8.55-4: XML DTD for <capability\_req>, <capabilities>

<!ELEMENT capability\_req EMPTY>

<!ELEMENT capabilities (GPS\_method?,GNSS\_method\*,GPS\_aid?,GNSS\_aid?,OTDOA\_capability?,ECID\_capability?,Bluetooth\_capability?,Sensor\_capability?,TBS\_capability?,WLAN\_capability?)>

   <!ELEMENT GPS\_Method (MSA\_sup?,MSB\_sup?,Standalone\_sup?)>

      <!ELEMENT MSA\_sup EMPTY>

         <!ATTLIST MSA\_sup fta\_sup CDATA "000"> <!-- as LPP fta-MeasSupport -->

      <!ELEMENT MSB\_sup EMPTY>

         <!ATTLIST MSB\_sup fta\_sup CDATA "000"

         velocity\_sup (true|false) "false">

      <!ELEMENT Standalone\_sup EMPTY>

         <!ATTLIST Standalone\_sup fta\_sup CDATA "000"

         <!-- as LPP fta-MeasSupport -->

         velocity\_sup (true|false) "false">

   <!ELEMENT GNSS\_Method (MSA\_sup?,MSB\_sup?,Standalone\_sup?)>

      <!ATTLIST GNSS\_Method supported\_signal (GPS\_L1|GPS\_L1C|GPS\_L2C|GPS\_L5|SBAS\_L1|GLO\_G1|GLO\_G2|GLO\_G3|BDS\_B1I) "GPS\_L1">

   <!ELEMENT GPS\_aid (almanac\_sup?,UTC\_model\_sup?,ionospheric\_sup?,nav\_model\_sup?,DGPS\_sup?,ref\_loc\_sup?,ref\_time\_sup?,acquisition\_sup?,rt\_integr\_sup?)>

      <!ELEMENT almanac\_sup EMPTY>

      <!ELEMENT UTC\_model\_sup EMPTY>

      <!ELEMENT ionospheric\_sup EMPTY>

      <!ELEMENT nav\_model\_sup EMPTY>

      <!ELEMENT DGPS\_sup EMPTY>

      <!ELEMENT ref\_loc\_sup EMPTY>

      <!ELEMENT ref\_time\_sup EMPTY>

      <!ELEMENT acquisition\_sup EMPTY>

      <!ELEMENT rt\_integr\_sup EMPTY>

   <!ELEMENT GNSS\_aid (ionospheric\_sup?,ref\_loc\_sup?,ref\_time\_sup?,earth\_orient\_sup?,GNSS\_aid\_for\_one\_gnss\*)>

      <!ELEMENT earth\_orient\_sup EMPTY>

      <!ELEMENT GNSS\_aid\_for\_one\_gnss (orbit\_sup\*,clock\_sup\*,acquisition\_sup?,rt\_integr\_sup?,GNSS\_auxiliary\_info\_sup?,GNSS\_databitassistance\_sup?,GNSS\_almanac\_sup?,GNSS\_UTC\_model\_sup?,BDS\_grid\_model\_sup?)>

         <!ATTLIST GNSS\_aid\_for\_one\_gnss

         gnss\_id (SBAS|MGPS|QZSS|Glonass|GPS|BDS) #IMPLIED

         sbas\_id (WASS|EGNOS|MSAS|GAGAN) #IMPLIED>

         <!ELEMENT orbit\_sup EMPTY>

            <!ATTLIST orbit\_sup model (2|3|4|5|6) #REQUIRED>

            <!-- 2=GPS NAV, 3=GPS CNAV, 4=Glonass, 5=SBAS, 6=BDS -->

         <!ELEMENT clock\_sup EMPTY>

            <!ATTLIST clock\_sup model (2|3|4|5|6) #REQUIRED>

         <!ELEMENT GNSS\_auxiliary\_info\_sup EMPTY>

         <!ELEMENT GNSS\_databitassistance\_sup EMPTY>

         <!ELEMENT GNSS\_almanac\_sup (almanac\_model)>

            <!ELEMENT almanac\_model (#PCDATA)> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular almanac model is supported –bit6 set means BDS almanac model is supported. -->

         <!ELEMENT GNSS\_UTC\_model\_sup (utc\_model)>

            <!ELEMENT utc\_model (#PCDATA)> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular UTC model is supported –bit4 set means BDS UTC model is supported -->

         <!ELEMENT BDS\_grid\_model\_sup EMPTY>

   <!ELEMENT OTDOA\_capability (otdoa\_mode,supported\_band\_list\_EUTRA,interFreqRSTDmeasurement-r10?)>

      <!ELEMENT otdoa\_mode #PCDATA> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular OTDOA mode is supported

bit0 –ue-assisted supported -->

      <!ELEMENT supported\_band\_list\_EUTRA (band\_EUTRA+)>

         <!ELEMENT band\_EUTRA (#PCDATA)> <!-- 1..64 -->

      <!ELEMENT interFreqRSTDmeasurement-r10 EMPTY>

   <!ELEMENT ECID\_capability (ECID\_measSupported)>

      <!ELEMENT ECID\_measSupported (#PCDATA)> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular ECID mode is supported bit0–rsrp Supported,bit1-rsrq Supported,bit2-ueRxTx Supported -->

<!ELEMENT Bluetooth\_capability (bluetooth\_modes,bluetooth\_meas\_sup)>

<!ELEMENT bluetooth\_modes #PCDATA> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular bluetooth mode is supported bit0-standalone, bit1–ue-assisted supported -->

<!ELEMENT bluetooth\_meas\_sup #PCDATA> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular bluetooth measurement is supported bit0-rssi -->

<!ELEMENT Sensor\_capability (sensor\_modes,sensor\_databitassistance\_sup)>

<!ELEMENT sensor\_modes #PCDATA> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular Sensor mode is supported bit0-standalone, bit1–ue-assisted bit2-ue-based supported -->

<!ELEMENT sensor\_databitassistance\_sup EMPTY>

<!ELEMENT TBS\_capability (tbs\_modes,tbs\_databitassistance\_sup)>

<!ELEMENT tbs\_modes #PCDATA> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular TBS mode is supported bit0-standalone, bit1–ue-assisted bit2-ue-based supported -->

<!ELEMENT tbs\_databitassistance\_sup (mbs\_acq,mbs\_almanac)>

<!ELEMENT mbs\_acq #PCDATA> <!-- boolean -->

<!ELEMENT mbs\_almanac #PCDATA> <!-- boolean -->

<!ELEMENT WLAN\_capability (wlan\_modes,wlan\_meas\_sup)>

<!ELEMENT wlan\_modes #PCDATA> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular WLAN mode is supported bit0-standalone, bit1–ue-assisted -->

<!ELEMENT wlan\_meas\_sup #PCDATA> <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular WLAN measurement is supported bit0-rssi, bit1–rtt -->

NOTE 3b: For elements ‘OTDOA\_capability’ and ‘ECID\_capability’, refer to 3GPP TS 36.355 [115] (subclause 6.5.1.7) and (subclause 6.5.3.4) respectively. Additionally, for elements ‘Bluetooth\_capability’, ‘Sensor\_capability’, ‘TBS\_capability’ and ‘WLAN\_capability’, refer to 3GPP TS 36.355 [115].

Table 8.55-5: XML DTD for <assist\_data>

<!ELEMENT assist\_data (GPS\_assist?,GNSS\_assist?,msr\_assist\_data?,system\_info\_assist\_data?,more\_assist\_data?,ext\_container?,rel98\_assist\_data\_ext?,rel5\_assist\_data\_ext?,rel7\_assist\_data\_ext?,OTDOA\_assist\_data?,GNSS\_loc\_server\_err?,OTDOA\_loc\_server\_err?,Sensor\_assist\_data?,TBS\_assist\_data?,Sensor\_loc\_server\_err?,TBS\_loc\_server\_err?)>

   <!ELEMENT GPS\_assist (status\_health?,BTS\_clock\_drift?,ref\_time\*,location\_parameters?,DGPS\_corrections?,nav\_model\_elem\*,ionospheric\_model?,UTC\_model?,almanac?,acqu\_assist\*,GPS\_rt\_integrity?)>

      <!ELEMENT status\_health (#PCDATA)>

      <!ELEMENT BTS\_clock\_drift (#PCDATA)>

      <!ELEMENT ref\_time (GPS\_time),(GSM\_time|WCDMA\_time|LTE\_time)?,TimeUnc?,GPS\_TOW\_assist\*)>

         <!ELEMENT GPS\_time (GPS\_TOW\_msec,GPS\_week)>

            <!ELEMENT GPS\_TOW\_msec (#PCDATA)>

            <!ELEMENT GPS\_week (#PCDATA)>

         <!ELEMENT GPS\_TOW\_assist (sat\_id,tlm\_word,anti\_sp,alert,tlm\_res)>

            <!ELEMENT sat\_id (#PCDATA)>

            <!ELEMENT tlm\_word (#PCDATA)>

            <!ELEMENT anti\_sp (#PCDATA)>

            <!ELEMENT alert (#PCDATA)>

            <!ELEMENT tlm\_res (#PCDATA)>

      <!ELEMENT DGPS\_corrections (sat\_id,iode,UDRE,PRC,RRC,delta\_PRC2?,delta\_RRC2?)>

         <!ELEMENT iode (#PCDATA)>

         <!ELEMENT UDRE (#PCDATA)>

         <!ELEMENT PRC (#PCDATA)>

         <!ELEMENT RRC (#PCDATA)>

         <!ELEMENT delta\_PRC2 (#PCDATA)>

         <!ELEMENT delta\_RRC2 (#PCDATA)>

      <!ELEMENT nav\_model\_elem (sat\_id,sat\_status,ephem\_and\_clock?)>

         <!ELEMENT sat\_status EMPTY>

            <!ATTLIST sat\_status literal (NS\_NN-U|ES\_NN-U|NS\_NN|ES\_SN|REVD) #REQUIRED>

         <!ELEMENT ephem\_and\_clock (l2\_code,ura,sv\_health,iodc,l2p\_flag,esr1,esr2,esr3,esr4,tgd,toc,af2,af1,af0,crs,delta\_n,m0,cuc,ecc,cus,power\_half,toe,fit\_flag,aoda,cic,omega0,cis,i0,crc,omega,omega\_dot,idot,derived?)>

            <!ELEMENT l2\_code (#PCDATA)>

            <!ELEMENT ura (#PCDATA)>

            <!ELEMENT sv\_health (#PCDATA)>

            <!ELEMENT iodc (#PCDATA)>

            <!ELEMENT l2p\_flag (#PCDATA)>

            <!ELEMENT esr1 (#PCDATA)>

            <!ELEMENT esr2 (#PCDATA)>

            <!ELEMENT esr3 (#PCDATA)>

            <!ELEMENT esr4 (#PCDATA)>

            <!ELEMENT tgd (#PCDATA)>

            <!ELEMENT toc (#PCDATA)>

            <!ELEMENT af2 (#PCDATA)>

            <!ELEMENT af1 (#PCDATA)>

            <!ELEMENT af0 (#PCDATA)>

            <!ELEMENT crs (#PCDATA)>

            <!ELEMENT delta\_n (#PCDATA)>

            <!ELEMENT m0 (#PCDATA)>

            <!ELEMENT cuc (#PCDATA)>

            <!ELEMENT ecc (#PCDATA)>

            <!ELEMENT cus (#PCDATA)>

            <!ELEMENT power\_half (#PCDATA)>

            <!ELEMENT toe (#PCDATA)>

            <!ELEMENT fit\_flag (#PCDATA)>

            <!ELEMENT aoda (#PCDATA)>

            <!ELEMENT cic (#PCDATA)>

            <!ELEMENT omega0 (#PCDATA)>

            <!ELEMENT cis (#PCDATA)>

            <!ELEMENT i0 (#PCDATA)>

            <!ELEMENT crc (#PCDATA)>

            <!ELEMENT omega (#PCDATA)>

            <!ELEMENT omega\_dot (#PCDATA)>

            <!ELEMENT idot (#PCDATA)>

            <!ELEMENT derived EMPTY> <!-- data derived locally, e.g from EE -->

      <!ELEMENT ionospheric\_model (alfa0,alfa1,alfa2,alfa3,beta0,beta1,beta2,beta3)>

         <!ELEMENT alfa0 (#PCDATA)>

         <!ELEMENT alfa1 (#PCDATA)>

         <!ELEMENT alfa2 (#PCDATA)>

         <!ELEMENT alfa3 (#PCDATA)>

         <!ELEMENT beta0 (#PCDATA)>

         <!ELEMENT beta1 (#PCDATA)>

         <!ELEMENT beta2 (#PCDATA)>

         <!ELEMENT beta3 (#PCDATA)>

      <!ELEMENT UTC\_model (a1,a0,tot,wnt,dtls,wnlsf,dn,dtlsf)>

         <!ELEMENT a1 (#PCDATA)>

         <!ELEMENT a0 (#PCDATA)>

         <!ELEMENT tot (#PCDATA)>

         <!ELEMENT wnt (#PCDATA)>

         <!ELEMENT dtls (#PCDATA)>

         <!ELEMENT wnlsf (#PCDATA)>

         <!ELEMENT dn (#PCDATA)>

         <!ELEMENT dtlsf (#PCDATA)>

      <!ELEMENT almanac (wna,alm\_elem\*)>

         <!ELEMENT wna (#PCDATA)>

         <!ELEMENT alm\_elem (data\_id?,sat\_id,alm\_ecc,alm\_toa,alm\_ksii,alm\_omega\_dot,alm\_sv\_health,alm\_power\_half,alm\_omega0,alm\_omega,alm\_m0,alm\_af0,alm\_af1)>

            <!ELEMENT data\_id (#PCDATA)>

            <!ELEMENT alm\_ecc (#PCDATA)>

            <!ELEMENT alm\_toa (#PCDATA)>

            <!ELEMENT alm\_ksii (#PCDATA)>

            <!ELEMENT alm\_omega\_dot (#PCDATA)>

            <!ELEMENT alm\_sv\_health (#PCDATA)>

            <!ELEMENT alm\_power\_half (#PCDATA)>

            <!ELEMENT alm\_omega0 (#PCDATA)>

            <!ELEMENT alm\_omega (#PCDATA)>

            <!ELEMENT alm\_m0 (#PCDATA)>

            <!ELEMENT alm\_af0 (#PCDATA)>

            <!ELEMENT alm\_af1 (#PCDATA)>

      <!ELEMENT GPS\_rt\_integrity (bad\_satellite\_set)>

          <!ELEMENT bad\_satellite\_set (sat\_id+)> <!-- 1..16 -->

   <!ELEMENT msr\_assist\_data EMPTY>

   <!ELEMENT system\_info\_assist\_data EMPTY>

   <!ELEMENT more\_assist\_data EMPTY>

   <!ELEMENT ext\_container EMPTY>

   <!ELEMENT rel98\_assist\_data\_ext EMPTY>

   <!ELEMENT rel5\_assist\_data\_ext EMPTY>

   <!ELEMENT rel7\_assist\_data\_ext EMPTY>

   <!ELEMENT OTDOA\_assist\_data(OTDOA\_ref\_cell\_info,OTDOA\_neighbour\_cell\_info\_list)>

      <!ELEMENT OTDOA\_ref\_cell\_info (phys\_cell\_id,cell\_global\_id,earfcn\_ref?,antenna\_port\_conf?,cp\_length,prs\_info?)>

         <!ELEMENT phys\_cell\_id (#PCDATA)> <!-- 0..503 -->

         <!ELEMENT cell\_global\_id (plmn\_identity,cell\_identity)>

            <!ELEMENT plmn\_identity (mcc,mnc)>

               <!ELEMENT mcc (#PCDATA)>

               <!ELEMENT mnc (#PCDATA)>

            <!ELEMENT cell\_identity #PCDATA> <!-- 32-bit extended UTRAN cell ID; in case the cell ID is shorter, the most significant bits are set to 0. -->

         <!ELEMENT earfcn\_ref (#PCDATA)> <!-- 0..65535 -->

         <!ELEMENT antenna\_port\_conf EMPTY>

            <!ATTLIST antenna\_port\_conf ports(ports1-or-2|ports4) "ports1-or-2">

         <!ELEMENT cp\_length EMPTY>

            <!ATTLIST cp\_length literal(normal|extended) #REQUIRED>

         <!ELEMENT prs\_info (prs\_bandwidth,prs\_conf\_index,num\_dl\_frames,prs\_muting\_info\_r9?)>

            <!ELEMENT prs\_bandwidth EMPTY>

               <!ATTLIST prs\_bandwidth literal(n6|n15|n25|n50|n75|n100)>

            <!ELEMENT prs\_conf\_index (#PCDATA)> <!-- 0..4095 -->

            <!ELEMENT num\_dl\_frames EMPTY>

               <!ATTLIST num\_dl\_frames literal(sf-1|sf-2|sf-4|sf-6)#REQUIRED>

            <!ELEMENT prs\_muting\_info\_r9 muting\_info>

               <!ATTLIST prs\_muting\_info\_r9 literal(po2-r9|po4-r9|po8-r9|po16-r9) #REQUIRED>

               <!ELEMENT muting\_info (#PCDATA)>

      <!ELEMENT OTDOA\_neighbour\_cell\_info\_list (OTDOA\_neighbour\_freq\_info)+>

         <!ELEMENT OTDOA\_neighbour\_freq\_info (OTDOA\_neighbour\_cell\_info\_element)+>

            <!ELEMENT OTDOA\_neighbour\_cell\_info\_element (phys\_cell\_id,cell\_global\_id?,earfcn?,cp\_length?,prs\_info?,antenna\_port\_conf?,slot\_number\_offset?,prs\_subframe\_offset?,expected\_RSTD,expected\_RSTD\_uncertainty)>

               <!ELEMENT phys\_cell\_id (#PCDATA)> <!-- 0..503 -->

               <!ELEMENT cell\_global\_id (#PCDATA)>

               <!ELEMENT earfcn (#PCDATA)> <!-- 0..65535 -->

               <!ELEMENT cp\_length EMPTY>

                  <!ATTLIST cp\_length literal(normal|extended) #REQUIRED>

               <!ELEMENT prs\_info (prs\_bandwidth,prs\_conf\_index,num\_dl\_frames,prs\_muting\_info\_r9?)>

                  <!ELEMENT prs\_bandwidth EMPTY>

                     <!ATTLIST prs\_bandwidth literal(n6|n15|n25|n50|n75|n100)>

                  <!ELEMENT prs\_conf\_index (#PCDATA)> <!-- 0..4095 -->

                  <!ELEMENT num\_dl\_frames EMPTY>

                     <!ATTLIST num\_dl\_frames literal(sf-1|sf-2|sf-4|sf-6)#REQUIRED>

                  <!ELEMENT prs\_muting\_info\_r9 muting\_info>

                     <!ATTLIST prs\_muting\_info\_r9 literal(po2-r9|po4-r9|po8-r9|po16-r9) #REQUIRED>

                     <!ELEMENT muting\_info (#PCDATA)>

               <!ELEMENT antenna\_port\_conf EMPTY>

                  <!ATTLIST antenna\_port\_conf ports(ports1-or-2|ports4) "ports1-or-2">

               <!ELEMENT slot\_number\_offset (#PCDATA)> <!-- 0..19 -->

               <!ELEMENT prs\_subframe\_offset (#PCDATA)> <!-- 0..1279 -->

               <!ELEMENT expected\_RSTD (#PCDATA)> <!-- 0..16383 -->

               <!ELEMENT expected\_RSTD\_uncertainty (#PCDATA)> <!-- 0..1023 -->

   <!ELEMENT GNSS\_loc\_server\_err \_EMPTY>

      <!ATTLIST GNSS\_loc\_server\_err literal (undefined\_error| undelivered\_assistance\_data\_not\_supported| undelivered\_assistance\_data\_supported\_but\_currently\_not\_available|undelivered\_assistance\_data\_is\_partly\_not\_supported\_and\_partly\_not\_available) #REQUIRED>

   <!ELEMENT OTDOA\_loc\_server\_err \_EMPTY>

      <!ATTLIST OTDOA\_loc\_server\_err literal (undefined\_error|assistance\_data\_not\_supported| assistance\_data\_supported\_but\_currently\_not\_available) #REQUIRED>

<!ELEMENT Sensor\_assist\_data(ref\_pressure?,ref\_position?,ref\_temperature?)>

<!ELEMENT ref\_pressure (#PCDATA)> <!-- -20000..10000 -->

<!ELEMENT ref\_position (ellipsoid\_point\_alt\_uncertellipse)>

<!ELEMENT ref\_temperature (#PCDATA)> <!-- -64..63 -->

<!ELEMENT TBS\_assist\_data(almanac?,acqu\_assist?)>

<!ELEMENT almanac (trans\_id,trans\_lat,trans\_long,trans\_alt,time\_correct?)>

<!ELEMENT trans\_id (#PCDATA)> <!-- 0..32767 -->

<!ELEMENT trans\_lat (#PCDATA)>

<!ELEMENT trans\_long (#PCDATA)>

<!ELEMENT trans\_alt (#PCDATA)>

<!ELEMENT time\_correct (#PCDATA)> <!-- 0..25 -->

<!ELEMENT acqu\_assist (trans\_id?,mbs\_config?,pn\_code?,freq?)>

<!ELEMENT trans\_id (#PCDATA)> <!-- 0..32767 -->

<!ELEMENT mbs\_config EMPTY>

<!ATTLIST mbs\_config literal(tb1|tb2|tb3|tb4)>

<!ELEMENT pn\_code (#PCDATA)> <!-- 1..128 -->

<!ELEMENT freq (#PCDATA)> <!-- 919750000..927250000 -->

   <!ELEMENT Sensor\_loc\_server\_err \_EMPTY>

      <!ATTLIST Sensor\_loc\_server\_err literal (undefined\_error|assistance\_data\_not\_supported| assistance\_data\_supported\_but\_currently\_not\_available) #REQUIRED>

   <!ELEMENT TBS\_loc\_server\_err \_EMPTY>

      <!ATTLIST TBS\_loc\_server\_err literal (undefined\_error|assistance\_data\_not\_supported| assistance\_data\_supported\_but\_currently\_not\_available) #REQUIRED>

NOTE 4: For the elements and the value ranges of assistance data information delivered from the network, refer to 3GPP TS 25.331 [74] (subclause 10.3.7.90), 3GPP TS 36.355 [115] (subclause 6.5.1) and 3GPP TS 44.031 [79] (subclause A.4.2.4). The value ranges of the relevant parameters are described in the ASN.1 syntax.

NOTE 5: For the element ‘location\_parameters’, see table 8.50-2. In the context of this XML, the ‘location\_parameters’ will describe a reference location.

NOTE 6: The elements ext\_container, rel98\_assist\_data\_ext, rel5\_assist\_data\_ext and rel7\_assist\_data\_ext are depreciated.

Table 8.55-6: XML DTD for <GSM\_time>, <WCDMA\_time>, <LTE\_time>, <TimeUnc>

<!ELEMENT GSM\_time (frame\_number,frame\_number\_msb,time\_slot\_number,bit\_number,BCCH\_carrier?,BSIC?)>

   <!ELEMENT frame\_number (#PCDATA)>

   <!ELEMENT frame\_number\_msb (#PCDATA)>

   <!ELEMENT time\_slot\_number (#PCDATA)>

   <!ELEMENT bit\_number (#PCDATA)>

   <!ELEMENT BCCH\_carrier (#PCDATA)>

   <!ELEMENT BSIC (#PCDATA)>

<!ELEMENT WCDMA\_time (cell\_timing\_chips,(FDD\_CPICH|TDD\_cell\_id|SFN),SFN\_TOW\_Unc?)>

   <!ELEMENT cell\_timing\_chips (#PCDATA)>

   <!ELEMENT FDD\_CPICH (#PCDATA)>

   <!ELEMENT TDD\_cell\_id (#PCDATA)>

   <!ELEMENT SFN (#PCDATA)>

   <!ELEMENT SFN\_TOW\_Unc (#PCDATA)> <!-- Integer 0..1 0- Uncertainity less than 10 ms, 1-Uncertainity more than 10 ms -->

<!ELEMENT LTE\_time (secFromFrameStructStart,fractSecFromFrameStructStart, frameDrift?,physCellId,cellGlobalIdEUTRA?,earfcn,TimeUnc)>

   <!ELEMENT secFromFrameStructStart (#PCDATA)> <!-- 0..12533 -->

   <!ELEMENT fractSecFromFrameStructStart (#PCDATA)> <!-- 0..3999999 -->

   <!ELEMENT frameDrift (#PCDATA)> <!-- -64..63 -->

   <!ELEMENT physCellId (#PCDATA)>

   <!ELEMENT cellGlobalIdEUTRA (#PCDATA)>

   <!ELEMENT earfcn (#PCDATA)>

<!ELEMENT TimeUnc EMPTY>

   <!ATTLIST TimeUnc

   Value CDATA "127"

   units (s|ms|us|rrlp\_k|rrc\_k|lpp\_k) "rrc\_k">

Table 8.55-7: XML DTD for <acqu\_assist>

<!ELEMENT acqu\_assist (tow\_msec,sat\_info\*,confidence\_r10?)>

   <!ELEMENT tow\_msec (#PCDATA)>

   <!ELEMENT sat\_info (sat\_id,dopl0,dopl\_extra?,code\_ph,code\_ph\_int,GPS\_bitno,srch\_w,az\_el?,doppler\_uncertainty\_ext\_r10?)>

      <!ELEMENT dopl0 (#PCDATA)>

         <!ATTLIST dopl0 units (rrlp|rrc|lpp|Hz|mps) "rrlp">

         <!-- rrlp gps is 2.5 Hz -->

         <!-- rrc gps is 2.5 Hz -->

         <!-- lpp gnss is 0.5 m/s -->

      <!ELEMENT dopl\_extra (dopl1,dopl1\_uncert)>

         <!ELEMENT dopl1 (#PCDATA)>

            <!ATTLIST dopl1 units (rrlp|rrc|lpp) "rrlp">

            <!-- rrlp is 1/42 Hz/s -->

            <!-- rrc is 0.023 Hz/s -->

            <!-- lpp is 1/210 m/s/s -->

         <!ELEMENT dopl1\_uncert EMPTY>

            <!ATTLIST dopl1\_uncert literal (hz12-5|hz25|hz50|hz100|hz200) #REQUIRED>

      <!ELEMENT code\_ph (#PCDATA)>

         <!ATTLIST code\_ph units (chips|ms) "chips">

         <!-- chips used for GPS in RRLP and RRC, ms used for LPP -->

      <!ELEMENT code\_ph\_int (#PCDATA)>

      <!ELEMENT GPS\_bitno (#PCDATA)>

      <!ELEMENT srch\_w (#PCDATA)>

      <!ELEMENT az\_el (az,elev)>

         <!ELEMENT az (#PCDATA)>

            <!ATTLIST az\_el units (rrlp|lpp|degree) "rrlp">

            <!-- rrlp and rrc have units of 11.25 degree -->

            <!-- lpp has units of 0.703125 degrees -->

         <!ELEMENT elev (#PCDATA)>

      <!ELEMENT doppler\_uncertainty\_ext\_r10>

         <!ATTLIST doppler\_uncertainty\_ext\_r10 (d60|d80|d100|d120|no\_information) #IMPLIED>

   <!ELEMENT confidence\_r10 (#PCDATA)> <!-- 0..100 -->

NOTE 7: Units of mps, lpp and ms are used with GNSS procedures.

Table 8.55-8: XML DTD for <pos\_meas>

<!ELEMENT pos\_meas (meas\_abort|RRLP\_meas|RRC\_meas)>

   <!ELEMENT meas\_abort EMPTY>

   <!ELEMENT RRLP\_meas (RRLP\_pos\_instruct)>

      <!ELEMENT RRLP\_pos\_instruct (RRLP\_method\_type,RRLP\_method,resp\_time\_seconds,mult\_sets)>

         <!ELEMENT RRLP\_method\_type (ms\_assisted|ms\_assisted\_no\_accuracy|ms\_based|ms\_based\_pref|ms\_assisted\_pref)>

            <!ELEMENT ms\_assisted (method\_accuracy)>

               <!ELEMENT method\_accuracy (#PCDATA)>

            <!ELEMENT ms\_assisted\_no\_accuracy EMPTY>

            <!ELEMENT ms\_based (method\_accuracy)>

            <!ELEMENT ms\_based\_pref (method\_accuracy)>

            <!ELEMENT ms\_assisted\_pref (method\_accuracy)>

         <!ELEMENT RRLP\_method EMPTY>

            <!ATTLIST RRLP\_method literal (gps) #REQUIRED>

         <!ELEMENT resp\_time\_seconds (#PCDATA)>

         <!ELEMENT mult\_sets EMPTY>

            <!ATTLIST mult\_sets literal (multiple|one) #REQUIRED>

   <!ELEMENT RRC\_meas (rep\_quant,rep\_crit)>

      <!ELEMENT rep\_quant (RRC\_method\_type,RRC\_method,hor\_acc?,vert\_acc?)>

         <!ATTLIST rep\_quant

         gps\_timing\_of\_cell\_wanted (true|false) "false"

         addl\_assist\_data\_req      (true|false) #REQUIRED>

         <!ELEMENT RRC\_method\_type EMPTY>

            <!ATTLIST RRC\_method\_type literal (ue\_assisted|ue\_based|ue\_based\_pref|ue\_assisted\_pref) #REQUIRED>

         <!ELEMENT RRC\_method EMPTY>

            <!ATTLIST RRC\_method literal (otdoa|gps|otdoaOrGPS|cellID) #REQUIRED>

         <!ELEMENT hor\_acc (#PCDATA)>

         <!ELEMENT vert\_acc (#PCDATA)>

      <!ELEMENT rep\_crit (no\_rep|event\_rep\_crit|period\_rep\_crit)>

         <!ELEMENT no\_rep EMPTY>

         <!ELEMENT event\_rep\_crit (event\_par\*)>

            <!ELEMENT event\_par (rep\_amount,meas\_interval,event\_specific\_info?)>

               <!ATTLIST event\_par report\_first\_fix (true|false) #REQUIRED>

               <!ELEMENT rep\_amount EMPTY>

                  <!ATTLIST rep\_amount literal (ra1|ra2|ra4|ra8|ra16|ra32|ra64|ra-Infinity) #REQUIRED>

               <!ELEMENT meas\_interval EMPTY>

                  <!ATTLIST meas\_interval literal (e5|e15|e60|e300|e900|e1800|e3600|e7200) #REQUIRED>

               <!ELEMENT event\_specific\_info (tr\_pos\_chg|tr\_SFN\_SFN\_chg|tr\_SFN\_GPS\_TOW)>

                  <!ELEMENT tr\_pos\_chg EMPTY>

                     <!ATTLIST tr\_pos\_chg literal (pc10|pc20|pc30|pc40|pc50|pc100|pc200|pc300|pc500|pc1000|pc2000|pc5000|pc10000|pc20000|pc50000|pc100000) #REQUIRED>

                  <!ELEMENT tr\_SFN\_SFN\_chg EMPTY>

                     <!ATTLIST tr\_SFN\_SFN\_chg literal (c0-25|c0-5|c1|c2|c3|c4|c5|c10|c20|c50|c100|c200|c500|c1000|c2000|c5000) #REQUIRED>

                  <!ELEMENT tr\_SFN\_GPS\_TOW EMPTY>

                     <!ATTLIST tr\_SFN\_GPS\_TOW literal (ms1|ms2|ms3|ms5|ms10|ms20|ms50|ms100) #REQUIRED>

         <!ELEMENT period\_rep\_crit EMPTY>

            <!ATTLIST period\_rep\_crit rep\_amount (ra1|ra2|ra4|ra8|ra16|ra32|ra64|ra-Infinity) "ra-Infinity">

            <!ATTLIST period\_rep\_crit rep\_interval\_long (ril0|ril0-25|ril0-5|ril1|ril2|ril3|ril4|ril6|ril8|ril12|ril16|ril20|ril24|ril28|ril32|ril64) #REQUIRED>

NOTE 8: For the elements and the value ranges of position measurements data, refer to 3GPP TS 25.331 [74] (subclause 10.3.7.100) and 3GPP TS 44.031 [79] (subclause A.2). The value ranges of the relevant parameters are described in the ASN.1 syntax.

Table 8.55-9: XML DTD for <pos\_meas\_req>

<!-- Alternative to pos\_meas, supports RRLP, RRC and LPP -->

<!ELEMENT pos\_meas\_req (abort|(req\_info,qos,loc\_coordinate\_types?))>

   <!ATTLIST pos\_meas\_req aid\_req\_allowed (yes|no) #IMPLIED> <!-- Present for RRC and LPP procedures -->

   <!ELEMENT abort EMPTY)>

   <!ELEMENT req\_info (GNSS\_allowed\_methods?)>

      <!ATTLIST req\_info loc\_info\_type (loc\_req|meas\_req|loc\_pref|MSB\_req|MSA\_req|MSB\_pref|MSA\_pref) "loc\_req"

      velocity\_req (true|false) "false"

      time\_req (true|false) "false"

      multiple\_sets (yes|no) "no"

      additional\_info (yes|no) "no"> <!-- lpp only --> <!-- MSB synonomous with loc\_req -->

      <!ELEMENT GNSS\_allowed\_methods (gps\_method?,sbas\_method?,qzss\_method?,glonass\_method?,BDS\_method?)>

         <!ELEMENT gps\_method EMPTY>

         <!ELEMENT sbas\_method EMPTY>

         <!ELEMENT qzss\_method EMPTY>

         <!ELEMENT glonass\_method EMPTY>

         <!ELEMENT BDS\_method EMPTY>

   <!ELEMENT qos (response\_time?,(reporting\_interval,amount)?,hacc?,vacc?)>

   <!-- The presence of reporting\_interval implies a periodic procedure -->

   <!-- The absence of reporting\_interval implies a one-shot procedure -->

      <!ELEMENT response\_time(time,responseTimeEarlyFix-r12?)

         <!ELEMENT time (#PCDATA)> <!-- 1..128 -->

         <!ELEMENT responseTimeEarlyFix-r12(#PCDATA)> <!-- 1..128,value of responseTimeEarlyFix-r12 should be less than time -->

      <!ELEMENT reporting\_interval EMPTY>

         <!ATTLIST reporting\_interval

         ri\_exp (ril1|ril2|ril3|ril4|ril6|ril8|ril12|ril16|ril20|ril24|ril28|ril32|ril64) "ril20" >

      <!ELEMENT amount EMPTY>

         <!ATTLIST amount amount (ra1|ra2|ra4|ra8|ra16|ra32|ra64|ra-Infinity) "ra-Infinity">

      <!ELEMENT hacc EMPTY>

         <!ATTLIST hacc

         accuracy\_k CDATA #IMPLIED

         confidence CDATA #IMPLIED>

      <!ELEMENT vacc EMPTY>

         <!ATTLIST vacc

         accuracy\_k CDATA #IMPLIED

         confidence CDATA #IMPLIED>

   <ELEMENT loc\_coordinate\_types(#PCDATA)>

   <!-- Integer corresponds to bit string 1-8 where bit at position if set, means location co-ordinate type is supported bit0-ellipsoidPoint supported,bit1-ellipsoidPointWithUncertaintyCircle supported,bit2-ellipsoidPointWithUncertaintyEllipse supported,bit3-polygon supported,bit4ellipsoidPointWithAltitude supported,bit5ellipsoidPointWithAltitudeAndUncertaintyEllipsoid supported,bit6-ellipsoidArc supported -->

Table 8.55-10: XML DTD for <GPS\_meas>

<!ELEMENT GPS\_meas (ref\_time\_only,meas\_params\*)>

   <!ELEMENT ref\_time\_only (tow\_msec)>

   <!ELEMENT meas\_params (sat\_id,carr2\_noise,dopl,whole\_chips,fract\_chips,multi\_path,psr\_rms\_err)>

      <!ELEMENT carr2\_noise (#PCDATA)>

      <!ELEMENT dopl (#PCDATA)>

      <!ELEMENT whole\_chips (#PCDATA)>

      <!ELEMENT fract\_chips (#PCDATA)>

      <!ELEMENT multi\_path EMPTY>

         <!ATTLIST multi\_path literal (not\_measured|low|medium|high) #REQUIRED>

      <!ELEMENT psr\_rms\_err (#PCDATA)>

NOTE 9: For the elements and the value ranges of GPS measurement data, refer to 3GPP TS 25.331 [74] (subclause 10.3.7.93) and 3GPP TS 44.031 [79] (subclause A.3.2.5). The value ranges of the relevant parameters are described in the ASN.1 syntax.

Table 8.55-11: XML DTD for <GNSS\_meas>

<!ELEMENT GNSS\_meas ( GNSS\_meas\_for\_one\_gnss+,TOD\_ms|ref\_time\_only,earlyFixReport-r12?)>

   <!ELEMENT GNSS\_meas\_for\_one\_gnss (GNSS\_sgn\_meas\_element+)

   <!ATTLIST GNSS\_meas\_for\_one\_gnss gnss\_id GPS|SBAS|QZSS|Galileo|Glonass|BDS) "GPS">

   <!ELEMENT GNSS\_sgn\_meas\_element (code\_phase\_ambiguity?, GNSS\_sat\_meas\_element+)>

      <!ATTLIST GNSS\_sgn\_meas\_element measured\_signal (GPS\_L1|GPS\_L1C|GPS\_L2C|GPS\_L5|SBAS\_L1|GLO\_G1|GLO\_G2|GLO\_G3|BDS\_B11) "GPS\_L1">

      <!ELEMENT code\_phase\_ambiguity (#PCDATA)> <!-- 0..127 -->

      <!ELEMENT GNSS\_sat\_meas\_element (sat\_id,carr2\_noise,doppler\_mps?,code\_phase\_ms?,integer\_code\_phase?,multi\_path,psr\_rms\_err,adr?,whole\_chips?,fract\_chips?,carrier\_quality\_ind?)>

      <!ELEMENT doppler\_mps (#PCDATA)> <!-- m/s Range -32768..32767 -->

      <!ELEMENT code\_phase\_ms (#PCDATA)> <!-- ms Range 0..2097151 -->

      <!ELEMENT integer\_code\_phase (#PCDATA)>

      <!ELEMENT adr (#PCDATA)>

      <!ELEMENT carrier\_quality\_ind (#PCDATA)> <!-- 0..3 -->

      <!ELEMENT TOD\_ms (gnss\_TOD\_msec,gnss\_TOD\_frac?,gnss\_TOD\_unc?) >

      <!ATTLIST TOD\_ms gnss\_time\_id (GPS|Glonass|QZSS|BDS) "GPS">

   <!ELEMENT earlyFixReport-r12 EMPTY>

NOTE 10: ‘GNSS\_meas’ is used for reporting measurements results for GNSS procedures i.e. procedures where: ‘GNSS\_allowed\_methods’, ‘GNSS\_assist’ was received or where ‘acqu\_assist’ uses units of ms.

NOTE 10a: ‘ref\_time\_only’ shall be provided by the TE for gnss\_id="GPS", refer to 3GPP TS 25.331 [74] (subclause 10.3.7.93) and 3GPP TS 44.031 [79] (subclause A.3). Usage of the element ‘GNSS\_meas’ in ‘GNSS\_provided\_location\_information’ can be omitted as ‘GNSS\_meas’ is already present in ‘pos’.

NOTE 10b: ‘whole\_chips’ and ‘fract\_chips’ to be provided for gnss\_id= "GPS"

Table 8.55-12: XML DTD for <GPS\_assist\_req>

<!ELEMENT GPS\_assist\_req (nav\_addl\_data?)>

   <!ATTLIST GPS\_assist\_req

   alm\_req        (true|false) "false"

   UTC\_model\_req  (true|false) "false"

   ion\_req        (true|false) "false"

   nav\_model\_req  (true|false) "false"

   DGPS\_corr\_req  (true|false) "false"

   ref\_loc\_req    (true|false) "false"

   ref\_time\_req   (true|false) "false"

   aqu\_assist\_req (true|false) "false"

   rt\_integr\_req  (true|false) "false">

   <!ELEMENT nav\_addl\_data (GPS\_week,GPS\_toe,ttoe\_limit,addl\_req\_sat\*)>

      <!ELEMENT GPS\_toe (#PCDATA)>

      <!ELEMENT ttoe\_limit (#PCDATA)>

      <!ELEMENT addl\_req\_sat (sat\_id,iode)>

NOTE 11: For requesting assistance data, refer to 3GPP TS 25.331 [74] (subclause 10.3.7.88a) and 3GPP TS 49.031 [80] (subclause 10.10).

Table 8.55-13: XML DTD for <msg>

<!ELEMENT msg EMPTY>

   <!ATTLIST msg status (assist\_data\_delivered|abort\_confirm) #REQUIRED>

NOTE 12: ‘assist\_data\_delivered’ can be used as an indication of completion of provision of assistance data.

NOTE 12a: ‘abort\_confirm’ can be used as an indication for positioning abort confirmation.

Table 8.55-14: XML DTD for <pos\_err>

<!ELEMENT pos\_err (err\_reason,GPS\_assist\_req?,ECID\_meas\_error\_cause?,GNSS\_assist\_req?)>

   <!ELEMENT err\_reason\_EMPTY>

      <!ATTLIST err\_reason literal (undefined\_error|not\_enough\_gps\_satellites|gps\_assist\_data\_missing|gnss\_assist\_data\_missing|not\_enough\_gnss\_satellites|OTDOA\_undefined|OTDOA\_assistance\_data\_missing|OTDOA\_unable\_to\_measure\_referencecell|OTDOA\_unable\_to\_measure\_any\_neighbourcell|OTDOA\_attempted\_but\_unable\_to\_measure\_some\_neighbourcells|ECID\_undefined|ECID\_requested\_measurement\_not\_available|ECID\_not\_all\_requested\_measurements\_possible|Bluetooth\_undefined|Bluetooth\_not\_all\_requested\_measurements\_possible|Sensor\_undefined|TBS\_undefined|TBS\_not\_enough\_MBS\_beacons|WLAN\_undefined|WLAN\_not\_all\_requested\_measurements\_possible) #REQUIRED>

   <!ELEMENT ECID\_meas\_error\_cause (#PCDATA)> <!-- Integer corresponds to bit string 1-8 where bit at position represents ECID error cause. Only applicable, when value of err\_reason = ”ECID\_not\_all\_requested\_measurements\_possible” bit0–rsrpMeasurementNotPossible, bit1- rsrqMeasurementNotPossible, bit2-ueRxTxMeasurementNotPossible -->

NOTE 13: For reporting positioning error, refer to 3GPP TS 25.331 [74] (subclause 10.3.7.87) and 3GPP TS 44.031 [79] (subclause A.3.2.6).

NOTE 13a: For reporting GNSS related positioning errors, refer to 3GPP TS 36.355 [115] (subclause 6.5.2.12) for LPP, 3GPP TS 25.331 [74] (subclause 10.3.7.87) for RRC and 3GPP TS 44.031 [79] (subclause A.3.2.6) for RRLP.

NOTE 13b: For reporting OTDOA and ECID errors, refer to 3GPP TS 36.355 [115] (subclause 6.5.1.9) for OTDOA specific errors and 3GPP TS 36.355 [115] (subclause 6.5.3.6) for ECID specific errors.

NOTE 13c: For reporting Bluetooth, Sensor, TBS and WLAN errors, refer to 3GPP TS 36.355 [115] for specific errors.

Table 8.55-15: XML DTD for <GNSS\_assist>, <GNSS\_assist\_req>

<!ELEMENT GNSS\_assist (GNSS\_ref\_time?,GNSS\_ref\_location?,GNSS\_ref\_measurment\_assist?,GNSS\_ionospheric\_model?,GNSS\_earth\_orient\_param?,GNSS\_additional\_ion\_model?,GNSS\_time\_model,GNSS\_nav\_model?,GNSS\_integrity?,acqu\_assist\*,GNSS\_databitassistance?,GNSS\_almanac?,GNSS\_UTC\_model?,BDS-GridModel-r12?,GNSS\_auxiliary\_info?)>

   <!ATTLIST GNSS\_assist

   gnss\_id (SBAS|MGPS|QZSS|Glonass|GPS|BDS) #IMPLIED

   sbas\_id (WASS|EGNOS|MSAS|GAGAN) #IMPLIED>

<!ELEMENT GNSS\_ref\_time (GNSS\_day,GNSS\_TOD\_s,notification\_leap\_sec?,GNSS\_TOD\_frac\_ms?,TimeUnc?)>

   <!ATTLIST GNSS\_ref\_time gnss\_time\_id (GPS|Glonass|QZSS|BDS) #REQUIRED>

   <!ELEMENT GNSS\_day (#PCDATA)>

   <!ELEMENT GNSS\_TOD\_s (#PCDATA)> <!-- 0..86399 seconds -->

   <!ELEMENT GNSS\_TOD\_frac\_ms (#PCDATA)> <!—- 0..999 milli-seconds -->

   <!-- TOD Uncertainty presented in TimeUnc -->

   <!ELEMENT notification\_leap\_sec (#PCDATA) > <!-- hex LPP only -->

<!ELEMENT GNSS\_ref\_location (location\_parameters)>

<!ELEMENT GNSS\_ref\_measurment\_assist (acqu\_assist)>

<!ELEMENT GNSS\_ionospheric\_model (gnss\_ion\_ai0,gnss\_ion\_ai1,gnss\_ion\_ai2,gnss\_ion\_flags?)>

   <!ELEMENT gnss\_ion\_ai0 (#PCDATA)> <!-- range 0..4095 -->

   <!ELEMENT gnss\_ion\_ai1 (#PCDATA)> <!-- range 0..4095 -->

   <!ELEMENT gnss\_ion\_ai2 (#PCDATA)> <!-- range 0..4095 -->

   <!ELEMENT gnss\_ion\_flags EMPTY>

      <!ATTLIST gnss\_ion\_flags

      storm\_flag1 (0|1) "0"

      storm\_flag2 (0|1) "0"

      storm\_flag3 (0|1) "0"

      storm\_flag4 (0|1) "0"

      storm\_flag5 (0|1) "0">

<!ELEMENT GNSS\_earth\_orient\_param (gnss\_eop\_teop,gnss\_eop\_pmX,gnss\_eop\_pmX\_d,gnss\_eop\_pmY,gnss\_eop\_pmY\_d,gnss\_eop\_deltaUT1,gnss\_eop\_deltaUT1\_d)>

   <!ELEMENT gnss\_eop\_teop (#PCDATA)> <!-- range 0..65535 -->

   <!ELEMENT gnss\_eop\_pmX (#PCDATA)> <!-- range -1048576..1048575 -->

   <!ELEMENT gnss\_eop\_pmX\_d (#PCDATA)> <!-- range -16384..16383 -->

   <!ELEMENT gnss\_eop\_pmY (#PCDATA)> <!-- range -1048576..1048575 -->

   <!ELEMENT gnss\_eop\_pmY\_d (#PCDATA)> <!-- range -16384..16383 -->

   <!ELEMENT gnss\_eop\_deltaUT1 (#PCDATA)> <!-- range -1073741824..1073741823 -->

   <!ELEMENT gnss\_eop\_deltaUT1\_d (#PCDATA)> <!-- range -262144..262143 -->

<!ELEMENT GNSS\_additional\_ion\_model (ionospheric\_model)>

   <!ATTLIST GNSS\_additional\_ion\_model

   ion\_model\_data\_id (00|11|01) "00"> <!-- from rrlp 11=QZSS 00=other 01=BDS -->

<!ELEMENT GNSS\_time\_model (tme\_ref\_time,tme\_A0,tme\_A1?,tme\_A2?,tme\_week?)>

   <!ATTLIST GNSS\_time\_model gnss\_time\_id (GPS|Glonass|QZSS|BDS) #REQUIRED>

   <!ELEMENT tme\_ref\_time (#PCDATA)> <!-- sec scale 2\*\*4 -->

   <!ELEMENT tme\_A0 (#PCDATA)> <!—sec scale 2\*\*-35 -->

   <!ELEMENT tme\_A1 (#PCDATA)> <!-- sec/sec scale 2\*\*-51 -->

   <!ELEMENT tme\_A2 (#PCDATA)> <!-- sec/sec sec scale 2\*\*-68 -->

   <!ELEMENT tme\_week (#PCDATA)> <!-- 0..8191 -->

<!ELEMENT GNSS\_nav\_model (GNSS\_satelite+)>

   <!ATTLIST GNSS\_nav\_model

   non\_broadcast\_ind\_flag (0|1) "0">

<!ELEMENT GNSS\_satelite (sat\_id,nms\_health,nms\_iod,

   ((nms\_clock\_nav,nms\_orbit\_nav)|

   (nms\_clock\_cnav,nms\_orbit\_cnav)|

   (nms\_clock\_glonass,nms\_orbit\_glonass)|

   (nms\_clock\_sbas,nms\_orbit\_sbas)|

   (nms\_clock\_bds,nms\_orbit\_bds)))>

   <!ELEMENT nms\_health (#PCDATA)> <!-- in hexadecimal -->

   <!ELEMENT nms\_iod (#PCDATA)> <!-- includes iod\_msb -->

<!ELEMENT GNSS\_integrity (bad\_signal\*)>

   <!ELEMENT bad\_signal (sat\_id,GNSS\_signal?)>

   <!ELEMENT GNSS\_signal (#PCDATA)>

<!ELEMENT GNSS\_databitassistance (gnss-TOD,gnss-TODfrac?,gnss-DataBitsSatList+)>

<!ELEMENT gnss-TOD (#PCDATA)> <!-- 0..3599 -->

   <!ELEMENT gnss-TODfrac (#PCDATA)> <!-- 0..99 -->

   <!ELEMENT gnss-DataBitsSatList(sat\_id,gnss-DataBitsSgnList+)>

   <!ATTLIST gnss-DataBitsSatList signal\_id (GPS\_L1|GPS\_L1C|GPS\_L2C|GPS\_L5|SBAS\_L1|GLO\_G1|GLO\_G2|GLO\_G3|BDS\_B1I) "GPS\_L1">

   <!ELEMENT gnss-DataBitsSgnList (GNSS\_databits)> <>

   <!ELEMENT GNSS\_databits (#PCDATA)> <!-- 1..1024 -->

   <!ELEMENT GNSS\_almanac(week\_number?,toa,ioda?,completeAlmanacProvided,gnss-AlmanacList+)>

   <!ELEMENT week\_number (#PCDATA)> <!-- 0..255 -->

   <!ELEMENT toa (#PCDATA)> <!-- 0..255 -->

   <!ELEMENT ioda(#PCDATA)> <!-- 0..3 -->

   <!ELEMENT completeAlmanacProvided (#PCDATA)>

   <!ELEMENT gnss-AlmanacList(keplerianBDS-Almanac-r12)>

   <!ELEMENT keplerianBDS-Almanac-r12(sat\_id,bdsAlmToa-r12?,bdsAlmSqrtA-r12,bdsAlmE-r12,bdsAlmW-r12,bdsAlmM0-r12,bdsAlmOmega0-r12,bdsAlmOmegaDot-r12,bdsAlmDeltaI-r12,bdsAlmA0-r12,bdsAlmA1-r12,bdsSvHealth-r12?)>

   <!ELEMENT bdsAlmToa-r12 (#PCDATA)> <!-- 0..256 -->

   <!ELEMENT bdsAlmSqrtA-r12 (#PCDATA)> <!-- 0..16777215 -->

   <!ELEMENT bdsAlmE-r12 (#PCDATA)> <!-- 0..131071 -->

   <!ELEMENT bdsAlmW-r12 (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT bdsAlmM0-r12 (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT bdsAlmOmega0-r12(#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT bdsAlmOmegaDot-r12 (#PCDATA)> <!-- -65536..65535 -->

   <!ELEMENT bdsAlmDeltaI-r12 (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT bdsAlmA0-r12 (#PCDATA)> <!-- -1024..1023 -->

   <!ELEMENT bdsAlmA1-r12 (#PCDATA)> <!-- -1024..1023 -->

   <!ELEMENT bdsSvHealth-r12(#PCDATA)> <!-- 0..3599 -->

<!ELEMENT GNSS\_UTC\_model (utcModel5-r12)>

   <!ELEMENT utcModel5-r12 (utcA0-r12,utcA1-r12,utcDeltaTls-r12,utcWNlsf-r12,utcDN-r12,utcDeltaTlsf-r12)>

   <!ELEMENT utcA0-r12 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT utcA1-r12 (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT utcDeltaTls-r12 (#PCDATA)> <!-- -128..127 -->

   <!ELEMENT utcWNlsf-r12 (#PCDATA)> <!-- 0..255 -->

   <!ELEMENT utcDN-r12(#PCDATA)> <!-- 0..255 -->

   <!ELEMENT utcDeltaTlsf-r12 (#PCDATA)> <!-- -128..127 -->

<!ELEMENT BDS-GridModel-r12(bds-RefTime-r12,gridIonList-r12+)>

   <!ELEMENT bds-RefTime-r12 (#PCDATA)> <!-- 0..3599 -->

   <!ELEMENT gridIonList-r12 (igp-ID-r12,dt-r12,givei-r12)>

   <!ELEMENT igp-ID-r12 (#PCDATA)> <!-- 1..320 -->

   <!ELEMENT dt-r12 (#PCDATA)> <!-- 0..511 -->

   <!ELEMENT givei-r12 (#PCDATA)> <!-- 0..15 -->

<!ELEMENT GNSS\_auxiliary\_info (GNSS\_id\_glonass)>

   <!ELEMENT GNSS\_id\_glonass (GNSS\_id\_glonass\_sat\_element+)>

      <!ELEMENT GNSS\_id\_glonass\_sat\_element (sat\_id,GNSS\_signal\_id,channel\_number?)> <!-- sat\_id 0..63 -->

         <!ELEMENT GNSS\_signal\_id (#PCDATA)>

<!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular signal is addressed; a zero‑value at the particular bit position means the signal is not addressed -->         <!ELEMENT channel\_number (#PCDATA)> <!-- -7..13 -->

<!ELEMENT GNSS\_assist\_req (GNSS\_assist\_req\_per\_gnss\*)>

   <!-- common assist req -->

   <!ELEMENT GNSS\_ref\_time\_req EMPTY>

      <!ATTLIST GNSS\_ref\_time\_req

      time\_req\_pref (SBAS|MGPS|QZSS|Glonass|GPS) #IMPLIED

      tow\_req (false|true) "false"

      leap\_sec\_req (false|true) #IMPLIED>

   <!ELEMENT GNSS\_ref\_loc\_req EMPTY>

   <!ELEMENT GNSS\_ion\_model\_req EMPTY>

   <!ELEMENT GNSS\_earth\_orient\_req EMPTY>

   <!-- generic req -->

   <!ELEMENT GNSS\_assist\_req\_per\_gnss (GNSS\_time\_model\_req?,GNSS\_navigation\_model\_req?,GNSS\_integrity\_req?,GNSS\_acquisition\_req?,GNSS\_auxiliary\_info\_req?,GNSS\_databitassistance\_req?,GNSS\_Almanac\_req?,GNSS\_UTC\_model\_req?,BDS\_grid\_model\_req\_r12?)>

      <!ATTLIST GNSS\_assist\_req\_per\_gnss

         gnss\_id (SBAS|MGPS|QZSS|Glonass|GPS) #REQUIRED

         sbas\_id (WASS|EGNOS|MSAS|GAGAN) #IMPLIED>

      <!ELEMENT GNSS\_time\_model\_req EMPTY>

      <!-- For LPP gnss-TO-IDsReq is derived from gnss\_id -->

         <!ATTLIST GNSS\_time\_model\_req delta\_T\_req (false|true) #IMPLIED>

      <!ELEMENT GNSS\_navigation\_model\_req (stored\_nav\_list?,requested\_nav\_list?) >

         <!ELEMENT stored\_nav\_list (snl\_week\_or\_day,snl\_toe,snl\_toe\_limit,stored\_sat\_list\_element\*,requested\_nav\_list?)>

            <!ELEMENT snl\_week\_or\_day (#PCDATA)>

            <!ELEMENT snl\_toe (#PCDATA)>

            <!ELEMENT snl\_toe\_limit (#PCDATA)>

            <!ELEMENT stored\_sat\_list\_element EMPTY>

               <!ATTLIST stored\_sat\_list\_element

               stored\_id CDATA #REQUIRED

               stored\_iod CDATA #REQUIRED

               stored\_clock\_model (2|3|4|5|6) #IMPLIED

               stored\_orbit\_model (2|3|4|5|6) #IMPLIED>

            <!ELEMENT requested\_nav\_list (requested\_nav\_list\_info\*)>

               <!ELEMENT requested\_nav\_list\_info EMPTY>

                  <!ATTLIST requested\_nav\_list\_info

                  requested\_sv CDATA "00000000ffffffff"

                  requested\_clock\_model (2|3|4|5|6) #IMPLIED

                  requested\_orbit\_model (2|3|4|5|6) #IMPLIED

                  requested\_add\_nav\_param (false|true) #IMPLIED>

               <!-- requested\_sv is a bit string in hexidecimal, needed for LPP -->

      <!ELEMENT GNSS\_integrity\_req EMPTY>

      <!ELEMENT GNSS\_acquisition\_req EMPTY>

         <!ATTLIST GNSS\_acquisition\_req signal (GPS\_L1|GPS\_L1C|GPS\_L2C|GPS\_L5|SBAS\_L1|GLO\_G1|GLO\_G2|GLO\_G3|BDS\_B1I) "GPS\_L1">

      <!ELEMENT GNSS\_databitassistance\_req (gnss\_TOD\_req,gnss\_TOD\_fraq?,databit\_interval,databit\_reqsat\_list+)>

         <!ATTLIST GNSS\_databitassistance\_req signal (GPS\_L1|GPS\_L1C|GPS\_L2C|GPS\_L5|SBAS\_L1|GLO\_G1|GLO\_G2|GLO\_G3|BDS\_B1l) "GPS\_L1">

         confidence\_support (yes|no) #IMPLIED

         doppler\_uncertainty\_ext\_support(yes|no) #IMPLIED>

         <!ELEMENT GNSS\_auxiliary\_info\_req EMPTY>

         <!ELEMENT gnss\_TOD\_req (#PCDATA)> <!-- 0..3599 -->

         <!ELEMENT gnss\_TOD\_fraq (#PCDATA)> <!-- 0..599 -->

         <!ELEMENT databit\_interval (#PCDATA)> <!-- 0..15 -->

         <!ELEMENT databit\_reqsat\_list (sat\_id)> <!-- sat\_id 0..63 -->

         <!ELEMENT GNSS\_Almanac\_req >

         <!ATTLIST GNSS\_Almanac\_req model (7)#IMPLIED>

         <!ELEMENT GNSS\_UTC\_model\_req >

         <!ATTLIST GNSS\_UTC\_model\_req model (5)#IMPLIED>

      <!ELEMENT BDS\_grid\_model\_req\_r12 EMPTY>

NOTE 14: GNSS\_assist is used for assistance data received via an RRLP ASN.1 GANSSAssistanceSet element (refer to 3GPP TS 44.031 [79]), via an RRC GANSS assistance data element (refer to 3GPP TS 25.331 [74] subclause 10.3.7.90b) or via LPP.

NOTE 14a: The element ‘GNSS\_ref\_measurement\_assist’ of ‘GNSS\_assist’ and ‘acqu\_assist’ of ‘GNSS\_assist’, both hold ‘acqu\_assist’ data. Therefore ‘GNSS\_ref\_measurement\_assist’ can be omitted when ‘acqu\_assist’ is present or vice versa.

Table 8.55-16: XML DTD for <nms\_clock\_nav>, <nms\_orbit\_nav>, <nms\_clock\_cnav>, <nms\_orbit\_cnav>

<!ELEMENT nms\_clock\_nav (nav\_Toc,nav\_af2,nav\_af1,nav\_af0,nav\_Tgd)>

   <!ELEMENT nav\_Toc (#PCDATA)> <!-- 0..37799 -->

   <!ELEMENT nav\_af2 (#PCDATA)> <!-- -128..127 -->

   <!ELEMENT nav\_af1 (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_af0 (#PCDATA)> <!-- -2097152..2097151 -->

   <!ELEMENT nav\_Tgd (#PCDATA)> <!-- -128..127 -->

<!ELEMENT nms\_orbit\_nav (nav\_URA,nav\_FitFlag,nav\_Toe,nav\_Omega,nav\_DeltaN,nav\_M0,nav\_OmegaA\_d,nav\_E,nav\_I\_d,nav\_APowerHalf,nav\_I0,nav\_OmegaA0,nav\_Crs,nav\_Cis,nav\_Cus,nav\_Crc,nav\_Cic,nav\_Cuc,(nav\_CodeOnL2,nav\_L2Pflag,nav\_sf1\_1,nav\_sf1\_2,nav\_sf1\_3,nav\_sf1\_4,nav\_AODA)?)>

   <!ELEMENT nav\_URA (#PCDATA)> <!-- 0..15 -->

   <!ELEMENT nav\_FitFlag (#PCDATA)> <!-- 0..1 -->

   <!ELEMENT nav\_Toe (#PCDATA)> <!-- 0..37799 -->

   <!ELEMENT nav\_Omega (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT nav\_DeltaN (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_M0 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT nav\_OmegaA\_d (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT nav\_E (#PCDATA)> <!-- 0..4294967295 -->

   <!ELEMENT nav\_I\_d (#PCDATA)> <!-- -8192..8191 -->

   <!ELEMENT nav\_APowerHalf (#PCDATA)> <!-- 0..4294967295 -->

   <!ELEMENT nav\_I0 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT nav\_OmegaA0 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT nav\_Crs (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_Cis (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_Cus (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_Crc (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_Cic (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_Cuc (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT nav\_CodeOnL2 (#PCDATA)> <!-- 0..3 -->

   <!ELEMENT nav\_L2Pflag (#PCDATA)> <!-- 0..1 -->

   <!ELEMENT nav\_sf1\_1 (#PCDATA)> <!-- 0..8388607 -->

   <!ELEMENT nav\_sf1\_2 (#PCDATA)> <!-- 0..16777215 -->

   <!ELEMENT nav\_sf1\_3 (#PCDATA)> <!-- 0..16777215 -->

   <!ELEMENT nav\_sf1\_4 (#PCDATA)> <!-- 0..65535 -->

   <!ELEMENT nav\_AODA (#PCDATA)> <!-- 0..31 -->

<!ELEMENT nms\_clock\_cnav (cnav\_Toc,cnav\_Top,cnav\_URA0,cnav\_URA1,cnav\_URA2,cnav\_Af2,cnav\_Af1,cnav\_Af0,cnav\_Tgd,cnav\_ISCl1cp?,cnav\_ISCl1cd?,cnav\_ISCl1ca?,cnav\_ISCl2c?,cnav\_ISCl5i5?,cnav\_ISCl5q5?)>

   <!ELEMENT cnav\_Toc (#PCDATA)> <!-- 0..2015 -->

   <!ELEMENT cnav\_Top (#PCDATA)> <!-- 0..2015 -->

   <!ELEMENT cnav\_URA0 (#PCDATA)> <!-- -16..15 -->

   <!ELEMENT cnav\_URA1 (#PCDATA)> <!-- 0..7 -->

   <!ELEMENT cnav\_URA2 (#PCDATA)> <!-- 0..7 -->

   <!ELEMENT cnav\_Af2 (#PCDATA)> <!-- -512..511 -->

   <!ELEMENT cnav\_Af1 (#PCDATA)> <!-- -524288..524287 -->

   <!ELEMENT cnav\_Af0 (#PCDATA)> <!-- -33554432..33554431 -->

   <!ELEMENT cnav\_Tgd (#PCDATA)> <!-- -4096..4095 -->

   <!ELEMENT cnav\_ISCl1cp (#PCDATA)> <!-- -4096..4095 -->

   <!ELEMENT cnav\_ISCl1cd (#PCDATA)> <!-- -4096..4095 -->

   <!ELEMENT cnav\_ISCl1ca (#PCDATA)> <!-- -4096..4095 -->

   <!ELEMENT cnav\_ISCl2c (#PCDATA)> <!-- -4096..4095 -->

   <!ELEMENT cnav\_ISCl5i5 (#PCDATA)> <!-- -4096..4095 -->

   <!ELEMENT cnav\_ISCl5q5 (#PCDATA)> <!-- -4096..4095 -->

<!ELEMENT nms\_orbit\_cnav (cnav\_Top,cnav\_URAindex,cnav\_DeltaA,cnav\_Adot,cnav\_DeltaNo,cnav\_DeltaNoDot,cnav\_Mo,cnav\_E,cnav\_Omega,cnav\_OMEGA0,cnav\_DeltaOmegaDot,cnav\_Io,cnav\_IoDot,cnav\_Cis,cnav\_Cic,cnav\_Crs,cnav\_Crc,cnav\_Cus,cnav\_Cuc)>

   <!ELEMENT cnav\_URAindex (#PCDATA)> <!-- -16..15 -->

   <!ELEMENT cnav\_DeltaA (#PCDATA)> <!-- -33554432..33554431 -->

   <!ELEMENT cnav\_Adot (#PCDATA)> <!-- -16777216..16777215 -->

   <!ELEMENT cnav\_DeltaNo (#PCDATA)> <!-- -65536..65535 -->

   <!ELEMENT cnav\_DeltaNoDot (#PCDATA)> <!-- -4194304..4194303 -->

   <!ELEMENT cnav\_Mo (#PCDATA)> <!-- -4294967296..4294967295 -->

   <!ELEMENT cnav\_E (#PCDATA)> <!-- 0..8589934591 -->

   <!ELEMENT cnav\_Omega (#PCDATA)> <!-- -4294967296..4294967295 -->

   <!ELEMENT cnav\_OMEGA0 (#PCDATA)> <!-- -4294967296..4294967295 -->

   <!ELEMENT cnav\_DeltaOmegaDot (#PCDATA)> <!-- -65536..65535 -->

   <!ELEMENT cnav\_Io (#PCDATA)> <!-- -4294967296..4294967295 -->

   <!ELEMENT cnav\_IoDot (#PCDATA)> <!-- -16384..16383 -->

   <!ELEMENT cnav\_Cis (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT cnav\_Cic (#PCDATA)> <!-- -32768..32767 -->

   <!ELEMENT cnav\_Crs (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT cnav\_Crc (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT cnav\_Cus (#PCDATA)> <!-- -1048576..1048575 -->

   <!ELEMENT cnav\_Cuc (#PCDATA)> <!-- -1048576..1048575 -->

.

Table 8.55-17: XML DTD for <nms\_orbit\_glonass>, <nms\_clock\_glonass>

<!ELEMENT nms\_orbit\_glonass (glo\_En,glo\_P1,glo\_P2,glo\_M,glo\_X,glo\_X\_d,glo\_X\_dd,glo\_Y,glo\_Y\_d,glo\_Y\_dd,glo\_Z\_d,glo\_Z\_dd)>

   <!ELEMENT glo\_En (#PCDATA)> <!-- 0..31 -->

   <!ELEMENT glo\_P1 (#PCDATA)> <!-- hex -->

   <!ELEMENT glo\_P2 (#PCDATA)> <!-- 0..1 -->

   <!ELEMENT glo\_M (#PCDATA)> <!-- 0..3 -->

   <!ELEMENT glo\_X (#PCDATA)> <!-- -67108864..67108863 -->

   <!ELEMENT glo\_X\_d (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT glo\_X\_dd (#PCDATA)> <!-- -16..15 -->

   <!ELEMENT glo\_Y (#PCDATA)> <!-- -67108864..67108863 -->

   <!ELEMENT glo\_Y\_d (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT glo\_Y\_dd (#PCDATA)> <!-- -16..15 -->

   <!ELEMENT glo\_Z (#PCDATA)> <!-- -67108864..67108863 -->

   <!ELEMENT glo\_Z\_d (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT glo\_Z\_dd (#PCDATA)> <!-- -16..15 -->

<!ELEMENT nms\_clock\_glonass (glo\_Tau,glo\_Gamma,glo\_DeltaTau)>

   <!ELEMENT glo\_Tau (#PCDATA)> <!-- -2097152..2097151 -->

   <!ELEMENT glo\_Gamma (#PCDATA)> <!-- -1024..1023 -->

   <!ELEMENT glo\_DeltaTau (#PCDATA)> <!-- -16..15 -->

Table 8.55-18: XML DTD for <nms\_clock\_sbas>, <nms\_orbit\_sbas>

<!ELEMENT nms\_clock\_sbas (sbas\_To,sbas\_Agfo,sbas\_Agf1)> <!-- model 4 -->

   <!ELEMENT sbas\_To (#PCDATA)>

   <!ELEMENT sbas\_Agfo (#PCDATA)>

   <!ELEMENT sbas\_Agf1 (#PCDATA)>

<!ELEMENT nms\_orbit\_sbas (sbas\_To,sbas\_accuracy,sbas\_Xg,sbas\_Yg,sbas\_Zg,sbas\_Xg\_d,sbas\_Yg\_d,sbas\_Zg\_d,sbas\_Xg\_dd,sbas\_Yg\_dd,sbas\_Zg\_dd)> <!-- model 4-->

   <!ELEMENT sbas\_accuracy (#PCDATA)> <!-- hex -->

   <!ELEMENT sbas\_Xg (#PCDATA)>

   <!ELEMENT sbas\_Yg (#PCDATA)>

   <!ELEMENT sbas\_Zg (#PCDATA)>

   <!ELEMENT sbas\_Xg\_d (#PCDATA)>

   <!ELEMENT sbas\_Yg\_d (#PCDATA)>

   <!ELEMENT sbas\_Zg\_d (#PCDATA)>

   <!ELEMENT sbas\_Xg\_dd (#PCDATA)>

   <!ELEMENT sbas\_Yg\_dd (#PCDATA)>

   <!ELEMENT sbas\_Zg\_dd (#PCDATA)>

Table 8.55-19: XML DTD for <GNSS\_provided\_location\_information>

<!ELEMNT GNSS\_provided\_location\_information (GNSS\_meas\*|(agnss\_list,GNSS\_meas\_ref\_time,locationparameters,earlyFixReport-r12?))>

   <!ELEMENT agnss\_list (#PCDATA) <!-- Integer corresponds to bit string 1-8 where bit at position if set, means particular GNSS id is supported bit0-GPS,bit1-sbas,bit2-qzss,bit3-galileo,bit4-glonass,bit5-bds -->

   <!ELEMENT GNSS\_meas\_ref\_time (gnss\_TOD\_msec,gnss\_TOD\_frac?,gnss\_TOD\_unc?)>

      <!ATTLIST GNSS\_meas\_ref\_time time\_id(SBAS|MGPS|QZSS|Glonass|GPS|BDS) #IMPLIED>

      <!ELEMENT gnss\_TOD\_msec (#PCDATA)> <!-- 0..3599999 -->

      <!ELEMENT gnss\_TOD\_frac (#PCDATA)> <!-- 0..39999 -->

      <!ELEMENT gnss\_TOD\_unc (#PCDATA)> <!-- 0..127 -->

NOTE 15: GNSS\_provide\_location\_information is used for reporting location information for GNSS procedures i.e. procedures where GNSS\_allowed\_methods or GNSS\_assist is received. This element matches the ASN.1 element GANSSLocationInfo for RRLP procedures; UE positioning measured results information element for RRC or ASN.1 A-GNSS-ProvideLocationInformation for LPP.

NOTE 15a: Both in ‘pos\_meas’ and ‘pos\_meas\_req’, either MS-Based or MS-Assisted positioning can be specified requiring either ‘location\_parameters’ or ‘GNSS\_meas’ elements respectively.

Table 8.55-20: XML DTD for <OTDOA\_meas>

<!ELEMENT OTDOA\_meas (system\_frame\_number,phys\_cell\_id\_ref,cell\_global\_id\_ref?,earfcn\_ref?,ref\_quality?,neighbour\_meas\_list,earlyFixReport-r12?)>

   <!ELEMENT system\_frame\_number (#PCDATA)>

   <!ELEMENT phys\_cell\_id\_ref (#PCDATA)> <!-- 0..503 -->

   <!ELEMENT cell\_global\_id\_ref (mcc,mnc,cell\_id)>

      <!ELEMENT mcc (#PCDATA)>

      <!ELEMENT mnc (#PCDATA)>

      <!ELEMENT cell\_id (#PCDATA)>

   <!ELEMENT earfcn\_ref (#PCDATA)> <!-- 0..65535 -->

   <!ELEMENT ref\_quality (OTDOA\_meas\_quality)>

   <!ELEMENT neighbour\_meas\_list (neighbour\_meas\_element)+>

      <!ELEMENT neighbour\_meas\_element (phys\_cell\_id\_neighbour,cell\_global\_id\_neighbour?,earfcn\_neighbour?,rstd,rstd\_quality)>

         <!ELEMENT phys\_cell\_id\_neighbour (#PCDATA)>

         <!ELEMENT cell\_global\_id\_neighbour (mcc,mnc,cell\_identity)>

            <!ELEMENT mcc (#PCDATA)>

            <!ELEMENT mnc (#PCDATA)>

            <!ELEMENT cell\_identity (#PCDATA)>

         <!ELEMENT earfcn\_neighbour (#PCDATA)> <!-- 0..65535 -->

         <!ELEMENT rstd (#PCDATA)> <!-- 0..12711 -->

         <!ELEMENT rstd\_quality (OTDOA\_meas\_quality)>

            <!ELEMENT OTDOA\_meas\_quality (err\_resolution,err\_value,err\_num\_samples?)>

               <!ELEMENT err\_resolution (#PCDATA)>

               <!ELEMENT err\_value (#PCDATA)>

               <!ELEMENT err\_num\_samples (#PCDATA)>

NOTE 16: For the elements and the value ranges of OTDOA measurements refer to 3GPP TS 36.355 [115] (subclause 6.5.1). The value ranges of relevant parameters are described in the ASN.1 syntax.

Table 8.55-21: XML DTD for <OTDOA\_assist\_req>

<!ELEMENT OTDOA\_assist\_req (phys\_cell\_id)>

   <!ELEMENT phys\_cell\_id (#PCDATA)> <!-- 0..503 -->

Table 8.55-22: XML DTD for <reset\_assist\_data>

<!ELEMENT reset\_assist\_data EMPTY> <!-- Reset UE positioning stored AGNSS/OTDOA/Sensor/TBS assistance data -->

NOTE 17: For resetting UE positioning stored AGNSS assistance data refer to 3GPP TS 36.509 [142] (subclause 6.9).

Table 8.55-23: XML DTD for <OTDOA\_ECID\_req>

<!ELEMENT OTDOA\_ECID\_req (abort|request\_location\_info)>

   <!ELEMENT abort EMPTY>

      <!ATTLIST abort abort\_otdoa\_meas\_req (true|false) "false"

      abort\_ecid\_meas\_req (true|false) "false"> <!-- Session ID will be provided in Transaction ID under root element <pos> -->

   <!ELEMENT request\_location\_info (OTDOA\_req\_loc\_info?,ECID\_req\_loc\_info?,(response\_time|periodic\_reporting|triggered\_reporting)?)> <!-- triggered\_reporting for ECID\_req\_loc\_info only -->

      <!ATTLIST request\_location\_info emergency\_call\_indicator (true|false) "false">

      <!ELEMENT OTDOA\_req\_loc\_info EMPTY>

         <!ATTLIST OTDOA\_req\_loc\_info assistance\_available (true|false) #REQUIRED>

      <!ELEMENT ECID\_req\_loc\_info EMPTY>

         <!ATTLIST ECID\_req\_loc\_info

         rs\_rp\_req (true|false) "false"

         rs\_rq\_req (true|false) "false"

         ue\_rx\_tx\_req (true|false) "false">

      <!ELEMENT response\_time(time,earlyFixReport-r12?)

      <!ELEMENT periodic\_reporting (rep\_amount,rep\_interval)>

         <!ELEMENT rep\_amount EMPTY>

            <!ATTLIST rep\_amount literal (ra1|ra2|ra4|ra8|ra16|ra32|ra64|ra-Infinity) #REQUIRED>

         <!ELEMENT rep\_interval EMPTY>

            <!ATTLIST rep\_interval literal (ri1|ri2|ri4|ri8|ri16|ri32|ri64)>

      <!ELEMENT triggered\_reporting (rep\_duration)>

         <!ATTLIST triggered\_reporting cell\_change (true|false) #REQUIRED>

         <!ELEMENT rep\_duration #PCDATA> <!-- 0..255 -->

NOTE 18: ‘emergency\_call\_indicator’ indicates whether the OTDOA and/or ECID location request is due to an Emergency Call.

Table 8.55-24: XML DTD for <ECID\_meas>

<!ELEMENT ECID\_meas (primary\_cell\_measured\_results?,measured\_result\_list)>

   <!ELEMENT primary\_cell\_measured\_results (measured\_result\_element)>

      <!ELEMENT measured\_result\_element (phys\_cell\_id,cell\_global\_id?,earfcn\_eutra,sfn?,rsrp\_result?,rsrq\_result?,ue\_rxtx\_time\_diff?)>

         <!ELEMENT phys\_cell\_id (#PCDATA)> <!-- 0..503 -->

         <!ELEMENT cell\_global\_id (mcc,mnc,cell\_id)>

            <!ELEMENT mcc (#PCDATA)>

            <!ELEMENT mnc (#PCDATA)>

            <!ELEMENT cell\_id (#PCDATA)>

         <!ELEMENT earfcn\_eutra (#PCDATA)> <!-- 0..262143 -->

      <!ELEMENT sfn (#PCDATA)>

      <!ELEMENT rsrp\_result (#PCDATA)> <!-- 0..97 -->

      <!ELEMENT rsrq\_result (#PCDATA)> <!-- 0..34 -->

      <!ELEMENT ue\_rxtx\_time\_diff (#PCDATA)> <!—0..4095 -->

   <!ELEMENT measured\_result\_list (measured\_result\_element+)> <!-- 1..32 -->

Table 8.55-25: XML DTD for <Strobe>

<!ELEMENT Strobe (#PCDATA)> <!— Triggers the generation of a strobe -->

Table 8.55-26: XML DTD for <nms\_clock\_bds>

<!ELEMENT nms\_clock\_bds (bdsToc-r12,bdsA0-r12,bdsA1-r12,bdsA2-r12,bdsTgd1-r12)>

   <!ELEMENT bdsToc-r12 (#PCDATA)> <!-- 0..131071 -->

   <!ELEMENT bdsA0-r12 (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT bdsA1-r12 (#PCDATA)> <!-- -2097152..2097151 -->

   <!ELEMENT bdsA2-r12 (#PCDATA)> <!-- -1024..1023 -->

   <!ELEMENT bdsTgd1-r12 (#PCDATA)> <!-- -512..511-->

Table 8.55-27: XML DTD for <nms\_orbit\_bds>

<!ELEMENT nms\_orbit\_bds(bdsURAI-r12,bdsToe-r12,bdsAPowerHalf-r12,bdsE-r12,bdsW-r12,bdsDeltaN-r12,bdsM0-r12,bdsOmega0-r12,bdsOmegaDot-r12,bdsI0-r12, bdsIDot-r12,bdsCuc-r12,bdsCus-r12,bdsCrc-r12,bdsCrs-r12,bdsCic-r12,bdsCis-r12)>

   <!ELEMENT bdsURAI-r12 (#PCDATA)> <!-- 0..15 -->

   <!ELEMENT bdsToe-r12 (#PCDATA)> <!-- 0..131071 -->

   <!ELEMENT bdsAPowerHalf-r12 (#PCDATA)> <!-- 0..4294967295 -->

   <!ELEMENT bdsE-r12 (#PCDATA)> <!-- 0..4294967295 -->

   <!ELEMENT bdsW-r12 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT bdsDeltaN-r12 (#PCDATA)> <!-- (-32768..32767 -->

   <!ELEMENT bdsM0-r12 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT bdsOmega0-r12 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT bdsOmegaDot-r12 (#PCDATA)> <!-- -8388608..8388607 -->

   <!ELEMENT bdsI0-r12 (#PCDATA)> <!-- -2147483648..2147483647 -->

   <!ELEMENT bdsIDot-r12 (#PCDATA)> <!-- -8192..8191 -->

   <!ELEMENT bdsCuc-r12 (#PCDATA)> <!-- -131072..131071 -->

   <!ELEMENT bdsCus-r12 (#PCDATA)> <!-- -131072..131071 -->

   <!ELEMENT bdsCrc-r12 (#PCDATA)> <!-- -131072..131071 -->

   <!ELEMENT bdsCrs-r12 (#PCDATA)> <!-- -131072..131071 -->

   <!ELEMENT bdsCic-r12 (#PCDATA)> <!-- -131072..131071 -->

   <!ELEMENT bdsCis-r12 (#PCDATA)> <!-- -131072..131071 -->

Table 8.55-28: XML DTD for <Bluetooth\_meas>

<!ELEMENT Bluetooth\_meas (meas\_ref\_time?,bt\_meas?)>

<!ELEMENT meas\_ref\_time (#PCDATA)> <!-- ASN.1 data type UTCTime -->

<!ELEMENT bt\_meas (bt\_addr,rssi?)>

<!ELEMENT bt\_addr (#PCDATA)>

<!ELEMENT rssi (#PCDATA)>

NOTE 19: For the elements and the value ranges of Bluetooth measurements refer to 3GPP TS 36.355 [115] (subclause 6.5.7). The value ranges of relevant parameters are described in the ASN.1 syntax.

Table 8.55-29: XML DTD for <Sensor\_meas>

<!ELEMENT Sensor\_meas (meas\_ref\_time?,unc\_baro\_pressure?,uncertainty?)>

   <!ELEMENT meas\_ref\_time (#PCDATA)> <!-- ASN.1 data type UTCTime -->

   <!ELEMENT unc\_baro\_pressure (#PCDATA)> <!-- 30000..115000 -->

   <!ELEMENT uncertainty (range,confidence)>

<!ELEMENT range (#PCDATA)> <!-- 0..1000 -->

<!ELEMENT confidence (#PCDATA)> <!-- 1..100 -->

NOTE 20: For the elements and the value ranges of Sensor measurements refer to 3GPP TS 36.355 [115] (subclause 6.5.5). The value ranges of relevant parameters are described in the ASN.1 syntax.

Table 8.55-30: XML DTD for <Sensor\_assist\_req>

<!ELEMENT Sensor\_assist\_req EMPTY>

Table 8.55-31: XML DTD for <TBS\_meas>

<!ELEMENT TBS\_meas (meas\_ref\_time?,mbs\_meas\_list?)>

<!ELEMENT meas\_ref\_time (#PCDATA)> <!-- ASN.1 data type UTCTime -->

<!ELEMENT mbs\_meas\_list (trans\_ID,code\_phase,code\_phase\_rms\_error)>

<!ELEMENT trans\_ID (#PCDATA)> <!-- 0..32767 -->

<!ELEMENT code\_phase (#PCDATA)> <!-- 0..2097151 -->

<!ELEMENT code\_phase\_rms\_error (#PCDATA)> <!-- 0..63 -->

NOTE 21: For the elements and the value ranges of TBS measurements refer to 3GPP TS 36.355 [115] (subclause 6.5.4). The value ranges of relevant parameters are described in the ASN.1 syntax.

Table 8.55-32: XML DTD for <TBS\_assist\_req>

<!ELEMENT TBS\_assist\_req (mbs\_almanac\_assist\_req,mbs\_acqu\_assist\_req)>

<!ELEMENT mbs\_almanac\_assist\_req EMPTY>

<!ELEMENT mbs\_acqu\_assist\_req EMPTY>

Table 8.55-33: XML DTD for <WLAN\_meas>

<!ELEMENT WLAN\_meas (meas\_ref\_time?,wlan\_meas\_list?)>

<!ELEMENT meas\_ref\_time (#PCDATA)> <!-- ASN.1 data type UTCTime -->

<!ELEMENT wlan\_meas\_list (wlan\_AP\_ID,rssi?,rtt?,ap\_ch\_freq?,serving\_flag?)>

<!ELEMENT wlan\_AP\_ID (#PCDATA)>

<!ELEMENT rssi (#PCDATA)>

<!ELEMENT rtt (#PCDATA)>

<!ELEMENT ap\_ch\_freq (#PCDATA)>

<!ELEMENT serving\_flag (true|false)>

NOTE 22: For the elements and the value ranges of WLAN measurements refer to 3GPP TS 36.355 [115] (subclause 6.5.6). The value ranges of relevant parameters are described in the ASN.1 syntax.

**Implementation**

Optional.

\*\*\*\*\* Next change \*\*\*\*\*

## 8.56 Positioning reporting +CPOSR

Table 8.56-1: +CPOSR parameter command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CPOSR=[<mode>] |  |
| +CPOSR? | +CPOSR: <mode> |
| +CPOSR=? | +CPOSR: (list of supported <mode>s) |

**Description**

Set command enables or disables the sending of unsolicited result codes. The XML-formatted string may be sent as one or more unsolicited result codes. Each part of the XML-formatted string is sent as one unsolicited result code, prefixed with +CPOSR.

NOTE: An XML-formatted string intended for +CPOSR can be split e.g. in order to prevent that the string becomes too long. Where to split an XML-formatted string is implementation specific. The characters <CR><LF>, <+CPOSR> and space(s) are ignored when re-constructing an XML-formatted string.

Example: +CPOSR: <One line of positioning data sent on XML format>.

There is no enhancement for location services in 5G that impacts the AT command.

Read command returns the current mode.

Test command returns the supported values as a compound value.

**Defined values**

<mode>: integer type

0 disables reporting

1 enables reporting

**Defined events**

<pos\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of position measurements data request as defined in table 8.55-8. This parameter shall not be subject to conventional character conversion as per +CSCS.

<pos\_meas\_req>: string type in UTF-8. This parameter provides an XML-formatted string of position measurements request data as defined in table 8.55-9. This is an alternative to <pos\_meas>. This parameter shall not be subject to conventional character conversion as per +CSCS.

<OTDOA\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of OTDOA measurement data as defined in table 8.55-20. This parameter shall not be subject to conventional character conversion as per +CSCS.

<ECID\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of ECID measurement data as defined in table 8.55-24. This parameter shall not be subject to conventional character conversion as per +CSCS.

<OTDOA\_assist\_req>: string type in UTF-8. This parameter provides an XML-formatted string for requesting OTDOA assistance data as defined in table 8.55-21. This parameter shall not be subject to conventional character conversion as per +CSCS.

<capabilities>: string type in UTF-8. This parameter provides an XML-formatted string for providing capability data as defined in table 8.55-4. This parameter shall not be subject to conventional character conversion as per +CSCS.

<msg>: string type in UTF-8. This parameter provides an XML-formatted string for communicating simple messages as defined in table 8.55-13. This parameter shall not be subject to conventional character conversion as per +CSCS.

<pos\_err>: string type in UTF-8. This parameter provides an XML-formatted string of positioning error parameters as defined in table 8.55-14. This parameter shall not be subject to conventional character conversion as per +CSCS.

<reset\_assist\_data>: string type in UTF-8. This parameter provides an XML-formatted string for resetting GNSS/OTDOA/Sensor/TBS assistance data as defined in table 8.55-22. This parameter shall not be subject to conventional character conversion as per +CSCS.

<Bluetooth\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of Bluetooth measurement data as defined in table 8.55-28. This parameter shall not be subject to conventional character conversion as per +CSCS.

<Sensor\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of Sensor measurement data as defined in table 8.55-29. This parameter shall not be subject to conventional character conversion as per +CSCS.

<Sensor\_assist\_req>: string type in UTF-8. This parameter provides an XML-formatted string for requesting Sensor assistance data as defined in table 8.55-30. This parameter shall not be subject to conventional character conversion as per +CSCS.

<TBS\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of TBS measurement data as defined in table 8.55-31. This parameter shall not be subject to conventional character conversion as per +CSCS.

<TBS\_assist\_req>: string type in UTF-8. This parameter provides an XML-formatted string for requesting TBS assistance data as defined in table 8.55-32. This parameter shall not be subject to conventional character conversion as per +CSCS.

<WLAN\_meas>: string type in UTF-8. This parameter provides an XML-formatted string of WLAN measurement data as defined in table 8.55-33. This parameter shall not be subject to conventional character conversion as per +CSCS.

**Implementation**

Optional.

\*\*\*\*\*Next change \*\*\*\*\*

## 8.57 Mobile terminated location request notification +CMTLR

Table 8.57-1: +CMTLR parameter command syntax

|  |  |
| --- | --- |
| Command | Possible response(s) |
| +CMTLR=[<subscribe>] |  |
| +CMTLR? | +CMTLR: <subscribe> |
| +CMTLR=? | +CMTLR: (list of supported <subscribe> values) |

**Description**

Set command enables Mobile Terminated Location Request (MT-LR) notifications to the TE. The parameter <subscribe> enables or disables notification by an unsolicited result code. It is possible to enable notification of MT-LR performed over the control plane or over SUPL or both. Relevant location request parameters are provided in the unsolicited result code +CMTLR: <handle-id>,<notification-type>,<location-type>,[<client-external-id>],[<client-name>][,<plane>].

This unsolicited result code is reported upon arrival of a Mobile Terminated Location Request. In order to differentiate multiple requests, every request is given a different <handle-id>. This ID is used when allowing or denying location disclosure with +CMTLRA.

There is no enhancement for location services in 5G that impacts the AT command.

Read command returns the current value of <subscribe>.

Test command returns the supported values as a compound value.

**Defined values**

<subscribe>: integer type. Enables and disables the subscription for MT-LR notifications.

0 Disables reporting and positioning.

1 Subscribe for notifications of MT-LR over control plane.

2 Subscribe for notifications of MT-LR over SUPL.

3 Subscribe for notifications of MT-LR over control plane and SUPL.

<handle-id>: integer type. ID associated with each MT-LR used to distinguish specific request in case of multiple requests. The value range is 0-255.

<notification-type>: integer type. Information about the user's privacy.

0 The subscription may stipulate that positioning the user by a third party is allowed and the network may choose to inform the user as a matter of courtesy.

1 Locating the user is permitted if the user ignores the notification.

2 Locating the user is forbidden if the user ignores the notification.

<location-type>: integer type. Indicates what type of the location is requested.

0 The current location.

1 The current or last known location.

2 The initial location.

<client-external-id>: string type. Indicates the external client where the location information is sent to (if required).

<client-name>: string type. Contains the string identifying the external client requesting the user's location.

<plane>: integer type. The parameter specifies whether the MT-LR came over control plane or SUPL.

0 Control plane.

1 Secure user plane (SUPL).

**Implementation**

Optional.

\*\*\*\*\*Next change \*\*\*\*\*