

---

**Source:** SA5 (Telecom Management)  
**Title:** 2 Rel-6 CR 32.401 Performance Management (PM); Concept and requirements  
**Document for:** Approval  
**Agenda Item:** 7.5.3

---

Doc-1 <sup>st</sup> -Level	Doc-2 <sup>nd</sup> -Level	Spec	CR	Rev	Phase	Subject	Cat	Ver-Cur	Wi
SP-040573	S5-048570	32.401	019	--	Rel-6	Removal of XML DTD file format definitions	C	6.2.0	OAM-PM
SP-040573	S5-048728	32.401	020	--	Rel-6	Add jobId in PM file name	B	6.2.0	OAM-PM

## CHANGE REQUEST

⌘ 32.401 CR 019 ⌘ rev - ⌘ Current vers 6.2.0 ⌘

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>	⌘ Removal of XML DTD file format definitions		
<b>Source:</b>	⌘ SA5 (peter.gaigg@siemens.com)		
<b>Work item code:</b>	⌘ OAM-PM	<b>Date:</b>	⌘ 02/07/2004
<b>Category:</b>	⌘ C	<b>Release:</b>	⌘ Rel-6
	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>	⌘ For several reasons it has been decided to remove XML DTD from the TS32.401 starting from Rel.-6.: a) The number of PM file formats shall be limited. b) For new XML definitions XML schema based formats are preferred, i.e. the XML schema is future-proof. c) A main technical reason is the size of the generated PM files using XML DTD which usually are about twice as big as PM files generated using XML schema.		
<b>Summary of change:</b>	⌘ All XML DTD related sections and text have been removed from the TS32.401.		
<b>Consequences if not approved:</b>	⌘ not applicable		

<b>Clauses affected:</b>	⌘ 3.2 Abbreviations, Annex A, Annex C										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; 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>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	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"/>										
<b>Other comments:</b>	⌘										

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

<b>Change in Clause 3.2</b>
-----------------------------

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G	3 <sup>rd</sup> Generation
AGCH	Access Grant Channel
APN	Access Point Name
ASN.1	Abstract Syntax Notation 1
AuC	Authentication Centre
BER	Basic Encoding Rules
BSC	Base Station Controller
BSS	Base Station System
BSSAP	BSS Application Part
BTS	Base Transceiver Station
CBCH	Cell Broadcast Channel
CCCH	Common Control Channel
DCCH	Dedicated Control Channel
DCN	Data Communication Network
<del>DTD</del>	<del>Document Type Definition</del>
EIR	Equipment Identity Register
EM	(Network) Element Manager
FACCH	Fast Associated Control Channel
FTAM	File Transfer Access and Management
FTP	File Transfer Protocol
GGSN	Gateway GPRS Service Node
GMSC	Gateway Mobile Services Switching Centre
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
GSN	GPRS Service Node
HLR	Home Location Register
HO	Handover
HPLMN	Home PLMN
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
ISDN	Integrated Service Digital Network
ISO	International Standards Organisation
Itf	Interface
LLC	Logical Link Control
LR	Location Register
MS	Mobile Station
MSC	Mobile Services Switching Centre
MSRN	Mobile Subscriber Roaming Number
MTP	Message Transfer Part
NE	Network Element
NM	Network Manager
NSS	Network Sub System (including EIR, HLR, SMS-IW MSC, MSC and VLR)
OA&M	Operation, Administration and Maintenance
OACSU	Off-Air Call Set Up
OS	Operations System (EM, NM)
OSI	Open Systems Interconnection
PCCCH	Packet Common Control Channel
PCCH	Packet Paging Channel
PCH	Paging Channel
PLMN	Public Land Mobile Network
PM	Performance Management

PTCH	Packet Traffic Channel
PVLR	Previous VLR
QoS	Quality of Service
RACH	Random Access Channel
Rec.	Recommendation
RF	Radio Frequency
RNC	Radio Network Controller
RR	Radio Resource
RXLEV	Reception Level
RXQUAL	Reception Quality
SACCH	Slow Associated Control Channel
SCCP	(ITU-T) Signalling Connection Control Part
SDCCH	Stand alone Dedicated Control Channel
SGSN	Serving GPRS Service Node
SMS-IW MSC	Short Message Service Inter Working MSC
SNDCP	Sub Network Dependency Control Protocol
SS	Supplementary Service
TCAP	(ITU-T) Transaction Capabilities Application Part
TCH	Traffic Channel
TFTP	Trivial FTP
TMN	Telecommunications Management Network
TMSI	Temporary Mobile Subscriber Identity
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
UTRAN	Universal Terrestrial Radio Access Network
VLR	Visitors Location Register

### End of Change in Clause 3.2

### Change in Clause Annex A

## Annex A (normative): Measurement Report File Format

This annex describes the format of measurement result files that can be transferred from the network (NEs or EM) to the NM. ~~Two~~ ~~three~~ alternative format definitions are specified, one using ASN.1 with binary encoding (BER), the ~~two others~~ ~~other one~~ applying XML (see [25]), which is ASCII based. ~~Of the two alternative XML format definitions, one is based on DTD, while the other~~ ~~The XML file format definition~~ is based on XML schema (see [26], [27] and [28]). Each 3G-system implementation complying with the present document shall support at least one of these ~~three~~ alternatives.

**NOTE:** ~~It is not intended to have the DTD-based XML format from Release 6 onwards defined as one of the alternate valid file formats for measurement result files.~~

Both the ASN.1 and XML file format definitions implement the measurement result structure and parameters defined in clauses 5.2 and 5.3 of the present document. The three defined file format definitions correspond to each other (except with some minor XML specific optimisations). This implies that the value ranges and size constraints defined in the ASN.1 definition shall also be valid for implementations of the XML format definition. From that perspective, the three format definitions can be regarded as three different instances of the same single format.

The following conditions have been considered in defining this file format:

- Since the files are transferred via a machine-machine interface, the files applying the format definitions should be machine-readable using standard tools.
- The file format should be independent of the data transfer protocol used to carry the file from one system to another.

- The file format should be generic across 3G systems.
- The file format should be flexible enough to include all possible measurement types, i.e. those specified within annex C as well as measurements defined within other standards bodies, or vendor specific measurement types.
- The file format should not impose any dependency between granularity periods for the generation of measurement results and file upload cycles for the file transfer from the network to the NM.
- The file format should be flexible enough to support both the NE-based and the EM-based approaches, as discussed in annex B, clause B.1.1 of the present document.
- The file format should be usable for other interfaces than Itf-N if required. The measurement file header could be augmented to indicate this other usage, however this would be a non-standard extension. In the ASN.1 file format definition, this is accommodated by the use of the ellipsis notation. XML [schema](#) allows such additions through [insertion of extra DTDs, schema elements, provided by through the provider definer](#) of the non-standard extension.

## A.1 Parameter description and mapping table

Table A.1 maps the tags defined in the ASN.1 file format definition to those used in the XML [schema based](#) file format definitions. ~~DTD based and XML schema based.~~ It also provides an explanation of the individual parameters. ~~The XML tags defined in the DTD (see clause A.3.1) have been kept as short as possible in order to minimise the size of the XML measurement result files.~~ XML tag attributes are useful where data values bind tightly to its parent element. They have been used where appropriate.

**Table A.1 Mapping of ASN.1 Measurement Report File Format tags to XML tags**

ASN.1 Tag	<del>DTD based XML tag</del>	XML schema based XML tag	Description
MeasDataCollection	<del>mde</del>	measCollecFile	This is the top-level tag, which identifies the file as a collection of measurement data. The file content is made up of a header ("measFileHeader"), the collection of measurement result items ("measData"), and a measurement file footer ("measFileFooter").
MeasFileHeader	<del>mfh</del>	fileHeader	This is the measurement result file header to be inserted in each file. It includes a version indicator, the name, type and vendor name of the sending network node, and a time stamp ("collectionBeginTime").
MeasData	<del>md</del>	measData	The "measData" construct represents the sequence of zero or more measurement result items contained in the file. It can be empty in case no measurement data can be provided. The individual "measData" elements can appear in any order. Each "measData" element contains the name of the NE ("nEId") and the list of measurement results pertaining to that NE ("measInfo").
MeasFileFooter	<del>mff</del>	fileFooter	The measurement result file footer to be inserted in each file. It includes a time stamp, which refers to the end of the overall measurement collection interval that is covered by the collected measurement results being stored in this file.

ASN.1 Tag	<del>DTD based XML tag</del>	XML schema based XML tag	Description
FileFormatVersion	<del>ffv</del>	fileHeader fileFormatVersion	This parameter identifies the file format version applied by the sender. The format version defined in the present document shall be the abridged number and version of this 3GPP document (see below) for <a href="#">the XML formats</a> and the ASN.1 format alike. The abridged number and version of a 3GPP document is constructed from its version specific full reference "3GPP [Ö] (yyyy-mm)" by: <ul style="list-style-type: none"> <li>- removing the leading "3GPP TS"</li> <li>- removing everything including and after the version third digit, representing editorial only changes, together with its preceding dot character</li> <li>- from the resulting string, removing leading and trailing white space, replacing every multi character white space by a single space character and changing the case of all characters to uppercase.</li> </ul>
SenderName	<del>sn</del>	fileHeader dnPrefix and fileSender localDn	The senderName uniquely identifies the NE or EM that assembled this measurement file by its Distinguished Name (DN), according to the definitions in 3GPP TS 32.300 [10]. In the case of the NE-based approach, it is identical to the sender's "nEDistinguishedName". For ASN.1 <del>and DTD based XML format</del> , the string may be empty (i.e. string size =0) in case the DN is not configured in the sender. For the XML schema based XML format, the DN is split into the DN prefix and the Local DN (LDN) (see 3GPP TS 32.300 [10]). <a href="#">The XML attribute specification "dnPrefix"</a> may be absent in case the DN prefix is not configured in the sender. <a href="#">The XML attribute specification "localDn"</a> may be absent in case the LDN is not configured in the sender.
SenderType	<del>st</del>	fileSender elementType	This is a user configurable identifier of the type of network node that generated the file, e.g. NodeB, EM, SGSN. The string may be empty (i.e. string size =0) in case the "senderType" is not configured in the sender. For the XML schema based XML format, XML attribute specification "elementType" may be absent in case the "senderType" is not configured in the sender.
VendorName	<del>vn</del>	fileHeader vendorName	The "vendorName" identifies the vendor of the equipment that provided the measurement file. The string may be empty (i.e. string size =0) if the "vendorName" is not configured in the sender. For the XML schema based XML format, XML attribute specification "vendorName" may be absent in case the "vendorName" is not configured in the sender.
CollectionBeginTime	<del>ebt</del>	measCollec beginTime	The "collectionBeginTime" is a time stamp that refers to the start of the first measurement collection interval (granularity period) that is covered by the collected measurement results that are stored in this file.
NEId	<del>neid</del>	managedElement	The unique identification of the NE in the system. It includes the user name ("nEUserName"), the distinguished name ("nEDistinguishedName") and the software version ("nESoftwareVersion") of the NE.
NEUserName	<del>neun</del>	managedElement userLabel	This is the user definable name ("userLabel") defined for the NE in 3GPP TS 32.622 [24]. The string may be empty (i.e. string size =0) if the "nEUserName" is not configured in the CM applications. For the XML schema based XML format, XML attribute specification "userLabel" may be absent in case the "nEUserName" is not configured in the CM applications.
NEdistinguishedName	<del>nedn</del>	fileHeader dnPrefix and managedElement localDn	This is the Distinguished Name (DN) defined for the NE in 3GPP TS 32.300 [10]. It is unique across an operator's 3G network. The string may be empty (i.e. string size =0) if the "nEDistinguishedName" is not configured in the CM applications. For the XML schema based XML format, the DN is split into the DN prefix and the Local DN (LDN) (see 3GPP TS 32.300 [10]). XML attribute specification "localDn" may be absent in case the LDN is not configured in the CM applications.

ASN.1 Tag	DTD based XML tag	XML schema based XML tag	Description
NESoftwareVersion	<del>nesw</del>	managedElement swVersion	This is the software version ("swVersion") defined for the NE in 3GPP TS 32.622 [24]. This is an optional parameter which allows post-processing systems to take care of vendor specific measurements modified between software versions. For the XML schema based XML format, XML attribute specification "swVersion" may be absent in case the "nESoftwareVersion" is not configured in the CM applications.
MeasInfo	<del>mi</del>	measInfo	The sequence of measurements, values and related information. It includes a list of measurement types ("measTypes") and the corresponding results ("measValues"), together with the time stamp ("measTimeStamp") and granularity period ("granularityPeriod") pertaining to these measurements.
MeasTimeStamp	<del>mts</del>	granPeriod endTime	Time stamp referring to the end of the granularity period.
JobId	<del>jobid</del>	job jobId	The "jobId" represents the job with which measurement result contained in the file is associated. The "jobId" is mandatory when PMIRP is supported.
GranularityPeriod	<del>gp</del>	granPeriod duration	Granularity period of the measurement(s) in seconds. For the XML schema based XML format, the value of XML attribute specification "duration" shall use the truncated representation "PTnS" (see [28]).
ReportingPeriod	<del>rp</del>	repPeriod duration	Reporting period of the measurement(s) in seconds. For the XML schema based XML format, the value of XML attribute specification "duration" shall use the truncated representation "PTnS" (see [28]). The "reportingPeriod" is mandatory when PMIRP is supported.
MeasTypes	<del>mt</del>	measTypes or measType	This is the list of measurement types for which the following, analogous list of measurement values ("measValues") pertains. The GSM only measurement types are defined in TS 52.402 [22]. The measurement types for UMTS and combined UMTS/GSM implementations are specified in TS 32.403 [23]. For the XML schema based XML format, depending on sender's choice for optional positioning presence, either XML element "measTypes" or XML elements "measType" will be used.
MeasValues	<del>mv</del>	measValue	This parameter contains the list of measurement results for the resource being measured, e.g. trunk, cell. It includes an identifier of the resource ("measObjInstId"), the list of measurement result values ("measResults") and a flag that indicates whether the data is reliable ("suspectFlag").
MeasObjInstId	<del>meoid</del>	measValue measObjLdn	The "measObjInstId" field contains the local distinguished name (LDN) of the measured object within the scope defined by the "nEDistinguishedName" (see 3GPP TS 32.300 [10]). The concatenation of the "nEDistinguishedName" and the "measObjInstId" yields the DN of the measured object. The "measObjInstId" is therefore empty if the "nEDistinguishedName" already specifies completely the DN of the measured object, which is the case for all measurements specified on NE level. For example, if the measured object is a "ManagedElement" representing RNC "RNC-Gbg-1", then the "nEDistinguishedName" will be for instance "DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,MeContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1", and the "measObjInstId" will be empty. On the other hand, if the measured object is a "UtranCell" representing cell "Gbg-997" managed by that RNC, then the "nEDistinguishedName" will be for instance the same as above, i.e. "DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,MeContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1", and the "measObjInstId" will be for instance "RncFunction=RF-1,UtranCell=Gbg-997". The class of the "measObjInstId" is defined in item F of each measurement definition template.

ASN.1 Tag	DTD based XML tag	XML schema based XML tag	Description
MeasResults	f	measResults or r	This parameter contains the sequence of result values for the observed measurement types. The "measResults" sequence shall have the same number of elements, which follow the same order as the measTypes sequence. Normal values are INTEGERS and REALS. The NULL value is reserved to indicate that the measurement item is not applicable or could not be retrieved for the object instance. For the XML schema based XML format, depending on sender's choice for optional positioning presence, either XML element "measResults" or XML elements "r" will be used.
SuspectFlag	sf	suspect	Used as an indication of quality of the scanned data. FALSE in the case of reliable data, TRUE if not reliable. The default value is "FALSE", in case the suspect flag has its default value it may be omitted.
TimeStamp	ts	measCollec endTime	ASN.1 GeneralizedTime format. The minimum required information within timestamp is year, month, day, hour, minute, and second.
Not Required	mt-p	measType p	An optional positioning XML attribute specification of XML element s-"mt" (DTD based) and "measType" (XML schema based), used to identify a measurement type for the purpose of correlation to a result. The value of this XML attribute specification is expected to be a non-zero, non-negative integer value that is unique for each instance of XML element " <del>mt</del> " or "measType" that is contained within the measurement data collection file.
Not Required	r-p	r p	An optional positioning XML attribute specification of XML element "r", used to correlate a result to a measurement type. The value of this XML attribute specification should match the value of XML attribute specification "p" of <a href="#">the</a> corresponding XML element " <del>mt</del> " (DTD based) or "measType" (XML schema based).

The measInfo contains the sequence of measurements, values and related information, in a table-oriented structure. A graphical representation of this structure, together with an ASN.1 and a XML example, can be found in annex C.

At least for those measurement types that are re-used from non-3GPP standards (e.g. IP, ATM), it is required that the measType be operator definable. This is necessary to allow the operator to harmonise the numbering between different vendors' systems where appropriate. Through this harmonisation, it can be assured that identical measurements always carry the same measType value, which is required by the post-processing system. This requirement will eventually be reflected in TS 52.402 [22] and TS 32.403 [23], which specify the performance measurements for GSM (TS 52.402 [22]) and UMTS and combined UMTS/GSM systems (TS 32.403 [23]).

## A.2 ASN.1 file format definition

For ASN.1 formatted files, BER encoding rules shall apply. Embedded comments are integral parts of the standard format; i.e. any implementation-claiming conformance to this annex shall also conform to the comments.

```

PM-File-Description
DEFINITIONS AUTOMATIC TAGS ::= BEGIN

MeasDataCollection ::= SEQUENCE
{
    measFileHeader    MeasFileHeader,
    measData          SEQUENCE OF MeasData,
    measFileFooter    MeasFileFooter
}

MeasFileHeader ::= SEQUENCE
{
    fileFormatVersion    PrintableString (SIZE (0..15)),
    senderName           PrintableString (SIZE (0..400)),

```



```

senderType          SenderType,
vendorName          PrintableString (SIZE (0..32)),
collectionBeginTime TimeStamp,
...
}

```

-- The sole purpose of the ellipsis notation used in the file header is to facilitate inter-release compatibility, vendor specific additions are not allowed in implementations claiming conformance to the TS. However, it is acknowledged that this feature does enable the use of non-standard extensions to the file header without losing compatibility to the file format specified in the present document.

```
SenderType ::= PrintableString (SIZE (0..8))
```

```
TimeStamp ::= GeneralizedTime
```

```
MeasData ::= SEQUENCE
{
  nEId          NEId,
  measInfo      SEQUENCE OF MeasInfo
}

```

```
NEId ::= SEQUENCE
{
  nEUserName          PrintableString (SIZE (0..64)),
  nEDistinguishedName PrintableString (SIZE (0..400)),
  nESoftwareVersion   PrintableString (SIZE (0..64)) OPTIONAL
}

```

```
MeasInfo ::= SEQUENCE
{
  measTimeStamp      TimeStamp,
  jobId              [1] INTEGER OPTIONAL,
  granularityPeriod  [2] INTEGER,
  reportingPeriod    [3] INTEGER OPTIONAL,
  measTypes          [4] SEQUENCE OF MeasType,
  measValues         SEQUENCE OF MeasValue
}

```

```
MeasType ::= PrintableString (SIZE (1..32))
```

```
MeasValue ::= SEQUENCE
{
  measObjInstId      MeasObjInstId,
  measResults        SEQUENCE OF MeasResult,
  suspectFlag        BOOLEAN DEFAULT FALSE
}

```

```
MeasObjInstId ::= PrintableString (SIZE (0..64))
```

```
MeasResult ::= CHOICE
{
  iValue INTEGER,
  rValue REAL,
  noValue NULL,
  ...
}

```

-- Normal values are INTEGERS and REALS. The NULL value is reserved to indicate that the measurement item is not applicable or could not be retrieved for the object instance. The sole purpose of the ellipsis notation used in the MeasResult choice is to facilitate inter-release compatibility in case the choice needs to be extended in future releases.

```
MeasFileFooter ::= TimeStamp
```

END

## A.3 ~~DTD based XML file format definition~~ Void

The character encoding shall be a subset of UTF-8. The characters in the ASN.1 type PrintableString are allowed, i.e.:

- A-Z;
- a-z;
- 0-9;
- <space>'() +, - . / : = ?'.

For encoding of the information content, XML (see Extensible Markup Language (XML) 1.0, W3C Recommendation 10 Feb 98) will be used. The XML **document type definition** contains the mark-up declarations that provide a grammar for the measurement file format. This grammar is known as a Document Type Definition (DTD). The DTD to be used is defined below. The type definitions and constraints for data types and values defined in the ASN.1 format, such as string sizes, shall implicitly be applied to the XML result files also. The representation of the timestamps within the XML file shall follow the "GeneralizedTime" ASN.1 type.

```
<!-- MeasDataCollection.dtd version 2.0 -->
<?xml version="1.0" encoding="UTF-8"?>
<!ELEMENT mdc (mfh, md*, mff)>
<!ELEMENT mfh (ffv, sn, st, vn, ebt)>
<!ELEMENT md (neid, mi*)>
<!ELEMENT neid (neun, nedn, nesw?)>
<!ELEMENT mi (mts, jobid?, gp, rp?, mt*, mv*)>
<!ELEMENT mv (moid, r*, sf?)>
<!ELEMENT mff (ts)>
<!ELEMENT jobid (#PCDATA)>
<!ELEMENT rp (#PCDATA)>
<!ELEMENT ts (#PCDATA)>
<!ELEMENT sf (#PCDATA)>
<!ELEMENT r (#PCDATA)>
<!ATTLIST r p CDATA "">
<!ELEMENT mt (#PCDATA)>
<!ATTLIST mt p CDATA "">
<!ELEMENT moid (#PCDATA)>
<!ELEMENT gp (#PCDATA)>
<!ELEMENT mts (#PCDATA)>
<!ELEMENT nedn (#PCDATA)>
<!ELEMENT neun (#PCDATA)>
<!ELEMENT nesw (#PCDATA)>
<!ELEMENT ebt (#PCDATA)>
<!ELEMENT vn (#PCDATA)>
<!ELEMENT st (#PCDATA)>
<!ELEMENT sn (#PCDATA)>
<!ELEMENT ffv (#PCDATA)>
<!-- end of MeasDataCollection.dtd -->
```

The number of Measurement Result tags (r) per observed object instance tags (moid) shall always equal the number of Measurement Types (mt) tags. In case the result is a REAL value the decimal separator shall be ".". In case the result is "NULL" then the "r" mark up shall be empty.

The following header shall be used in actual XML measurement result files (cf. annex D for an example):

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="MeasDataCollection.xsl"?>
<!DOCTYPE mdc SYSTEM "MeasDataCollection.dtd">
<mdc xmlns:HTML="http://www.w3.org/TR/REC-xml">
```

— Line 1: xml version number 1 shall be used.

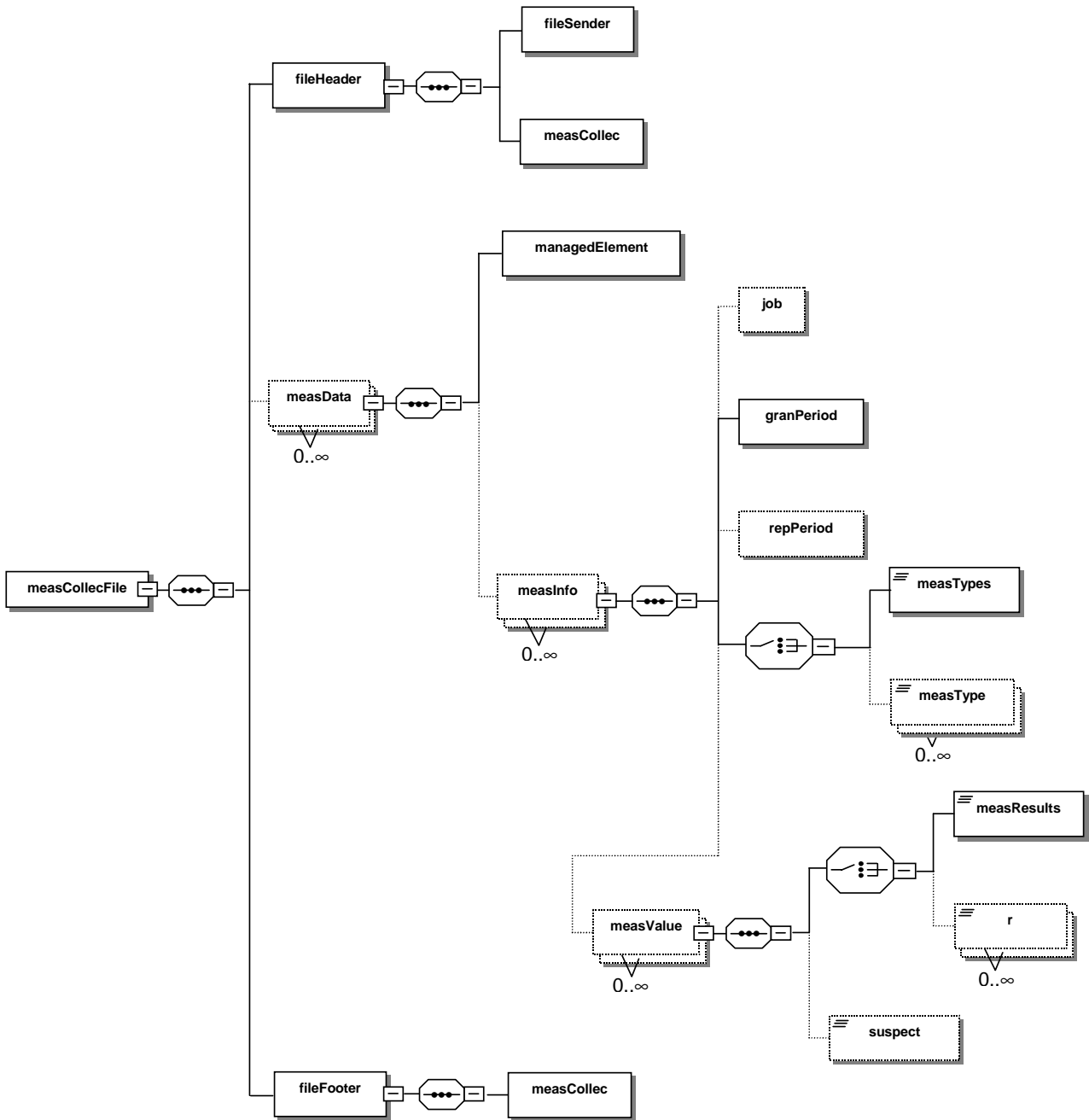
- ~~—The reference to an XSL (Extensible Stylesheet Language) or CSS (Cascading Style Sheet) file in line 2 of the header is optional. It may be configured by the operator to be inserted for the purpose of presenting the XML file in a web browser GUI. It is up to the receiver of the file to decide on the usage of this stylesheet reference, e.g. ignore it if not needed or choosing a configured default if no style sheet reference is supplied in the file.~~
- ~~—Line 4: A reference to the W3C Recommendation web page for XML.~~
- ~~—Quick guide to XML notation: ? zero or one occurrence~~
- ~~+ one or more occurrences~~
- ~~\* zero or more occurrences~~
- ~~#PCDATA parsed character data~~

---

## A.4 XML schema based XML file format definition

### A.4.1 Measurement collection data file XML diagram

Figure A.1 describes the XML element structure of the measurement collection data file.



- xxx Element named xxx. The maximum number of occurrence is 1.
- xxx  
0..∞ Element named xxx. The maximum number of occurrences is unbounded. There may be no occurrence.
- Required element
- ⋯ Optional element
- ⋯ Sequence
- ⋮ Choice
- ≡ Element with a data content

**Figure A.1: XML diagram of the measurement collection data file**

## A.4.2 Measurement collection data file XML schema

The following XML schema `measCollec.xsd` is the schema for measurement collection data XML files:

```
<?xml version="1.0" encoding="UTF-8"?>

<!--
  3GPP TS 32.401 PM Concept and Requirements
  Measurement collection data file XML schema
  measCollec.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32401-620.zip#measCollec"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:mc=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32401-620.zip#measCollec"
>

  <!-- Measurement collection data file root XML element -->

  <element name="measCollecFile">
    <complexType>
      <sequence>
        <element name="fileHeader">
          <complexType>
            <sequence>
              <element name="fileSender">
                <complexType>
                  <attribute name="localDn" type="string" use="optional"/>
                  <attribute name="elementType" type="string" use="optional"/>
                </complexType>
              </element>
              <element name="measCollec">
                <complexType>
                  <attribute name="beginTime" type="dateTime" use="required"/>
                </complexType>
              </element>
            </sequence>
            <attribute name="fileFormatVersion" type="string" use="required"/>
            <attribute name="vendorName" type="string" use="optional"/>
            <attribute name="dnPrefix" type="string" use="optional"/>
          </complexType>
        </element>
        <element name="measData" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <sequence>
              <element name="managedElement">
                <complexType>
                  <attribute name="localDn" type="string" use="optional"/>
                  <attribute name="userLabel" type="string" use="optional"/>
                  <attribute name="swVersion" type="string" use="optional"/>
                </complexType>
              </element>
              <element name="measInfo" minOccurs="0" maxOccurs="unbounded">
                <complexType>
                  <sequence>
                    <element name="job" minOccurs="0">
                      <complexType>
                        <attribute name="jobId" type="string" use="required"/>
                      </complexType>
                    </element>
                    <element name="granPeriod">

```

```

    <complexType>
      <attribute
        name="duration"
        type="duration"
        use="required"
      />
      <attribute
        name="endTime"
        type="dateTime"
        use="required"
      />
    </complexType>
  </element>
  <element name="repPeriod" minOccurs="0">
    <complexType>
      <attribute name="duration"
        type="duration" use="required"/>
    </complexType>
  </element>
  <choice>
    <element name="measTypes">
      <simpleType>
        <list itemType="Name"/>
      </simpleType>
    </element>
    <element name="measType"
      minOccurs="0" maxOccurs="unbounded">
      <complexType>
        <simpleContent>
          <extension base="Name">
            <attribute name="p"
              type="positiveInteger" use="required"/>
          </extension>
        </simpleContent>
      </complexType>
    </element>
  </choice>
  <element name="measValue"
    minOccurs="0" maxOccurs="unbounded">
    <complexType>
      <sequence>
        <choice>
          <element name="measResults">
            <simpleType>
              <list itemType="mc:measResultType"/>
            </simpleType>
          </element>
          <element name="r"
            minOccurs="0" maxOccurs="unbounded">
            <complexType>
              <simpleContent>
                <extension base="mc:measResultType">
                  <attribute name="p" type="positiveInteger"
                    use="required"/>
                </extension>
              </simpleContent>
            </complexType>
          </element>
        </choice>
        <element name="suspect" type="boolean" minOccurs="0"/>
      </sequence>
      <attribute name="measObjLdn"
        type="string" use="required"/>
    </complexType>
  </element>
</sequence>

```

```

        </complexType>
      </element>
    </sequence>
  </complexType>
</element>
<element name="fileFooter">
  <complexType>
    <sequence>
      <element name="measCollec">
        <complexType>
          <attribute name="endTime" type="dateTime" use="required"/>
        </complexType>
      </element>
    </sequence>
  </complexType>
</element>
</sequence>
</complexType>
</element>

<simpleType name="measResultType">
  <union memberTypes="decimal">
    <simpleType>
      <restriction base="string">
        <enumeration value="NIL"/>
      </restriction>
    </simpleType>
  </union>
</simpleType>
</schema>

```

### A.4.3 Measurement collection data file XML header

The following header shall be used in actual XML measurement result files (cf. annex D for examples):

```

<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="MeasDataCollection.xsl"?>
<measCollecFile
  xmlns=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32401-620.zip#measCollec"
>

```

<b>End of Change in Clause Annex A</b>
--

<b>Change in Clause Annex C3</b>
----------------------------------

## C.3 ~~Example of DTD based XML Measurement Report~~ FileVoid

The following is an example of a DTD based XML measurement report file without use of optional positioning attributes on measurement types and results:

```

<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="MeasDataCollection.xsl"?>
<!DOCTYPE mde SYSTEM "MeasDataCollection.dtd">
<mde>
  <mfh>
    <ffv>32.401 V6.0</ffv>
    <sn>DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,
      MeContext=MEC Gbg 1,ManagedElement=RNC Gbg 1</sn>
    <st>RNC</st>
    <vn>Company NN</vn>
    <ebt>20000301140000</ebt>
  </mfh>
  <md>
    <neid>
      <neun>RNC Telecomville</neun>
      <nedn>DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,
        MeContext=MEC Gbg 1,ManagedElement=RNC Gbg 1</nedn>
    </neid>
    <mi>
      <mts>20000301141430</mts>
      <jobid>1231</jobid>
      <gp>900</gp>
      <rp>1800</rp>
      <mt>attTCHSeizures</mt>
      <mt>succTCHSeizures</mt>
      <mt>attImmediateAssignProcs</mt>
      <mt>succImmediateAssignProcs</mt>
      <mv>
        <moid>RncFunction=RF 1,UtranCell=Cbg 997</moid>
        <r>234</r>
        <r>345</r>
        <r>567</r>
        <r>789</r>
      </mv>
      <mv>
        <moid>RncFunction=RF 1,UtranCell=Cbg 998</moid>
        <r>890</r>
        <r>901</r>
        <r>123</r>
        <r>234</r>
      </mv>
      <mv>
        <moid>RncFunction=RF 1,UtranCell=Cbg 999</moid>
        <r>456</r>
        <r>567</r>
        <r>678</r>
        <r>789</r>
        <sf>TRUE</sf>
      </mv>
    </mi>
  </md>
  <mf f>
    <ts>20000301141500</ts>
  </mf f>
</mde>

```



The following is an example of a DTD-based XML measurement report file with use of optional positioning attributes on measurement types and results:

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="MeasDataCollection.xsl"?>
<!DOCTYPE mde SYSTEM "MeasDataCollection.dtd">
<mde>
  <mfh>
    <ffv>32.401 V6.0</ffv>
    <sn>DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,
      MeContext=MEC Gbg 1,ManagedElement=RNC Gbg 1</sn>
    <st>RNC</st>
    <vn>Company NN</vn>
    <cbt>2000030114000</cbt>
  </mfh>
  <md>
    <neid>
      <neun>RNC Telecomville</neun>
      <nedn>DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1,SubNetwork=CountryNN,
        MeContext=MEC Gbg 1,ManagedElement=RNC Gbg 1</nedn>
    </neid>
    <mi>
      <mts>20000301141430</mts>
      <jobid>1231</jobid>
      <gp>900</gp>
      <rp>1800</rp>
      <mt p="1">attTCHSeizures</mt>
      <mt p="2">succTCHSeizures</mt>
      <mt p="3">attImmediateAssignProcs</mt>
      <mt p="4">succImmediateAssignProcs</mt>
      <mv>
        <moid>RncFunction=RF 1,UtranCell=Gbg 997</moid>
        <r p="1">234</r>
        <r p="2">345</r>
        <r p="3">567</r>
        <r p="4">789</r>
      </mv>
      <mv>
        <moid>RncFunction=RF 1,UtranCell=Gbg 998</moid>
        <r p="1">890</r>
        <r p="2">901</r>
        <r p="3">123</r>
        <r p="4">234</r>
      </mv>
      <mv>
        <moid>RncFunction=RF 1,UtranCell=Gbg 999</moid>
        <r p="1">456</r>
        <r p="2">567</r>
        <r p="3">678</r>
        <r p="4">789</r>
        <sf>TRUE</sf>
      </mv>
    </mi>
  </md>
  <mfef>
    <ts>20000301141500</ts>
  </mfef>
</mde>
```

**End of Change in Clause Annex C3**

## Annex D (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
June 2001	S_12	SP-010237	--	--	Submitted to TSG SA #12 for Information.	--	1.0.0
June 2001	--	--	--	--	MCC editorials	1.0.0	1.0.1
Sep 2001	S_13	SP-010467	--	--	Submitted to TSG SA #13 for Approval	2.0.0	4.0.0
Dec 2001	S_14	SP-010638	001	--	Correction of declaration in XML header	4.0.0	4.1.0
Mar 2002	S_15	--	--	--	Automatic upgrade to Rel-5 (no Rel-5 CR)	4.1.0	5.0.0
Sep 2002	S_17	SP-020502	003	--	Description of Alarm IRP usage for performance alarms	5.0.0	5.1.0
Sep 2002	S_17	SP-020502	004	--	Addition of measurement file XML schema and miscellaneous alignments with CM	5.0.0	5.1.0
Jun 2003	S_20	SP-030291	006	--	Clarification of NE file generation behaviour in case of multiple granularity periods	5.1.0	5.2.0
Jun 2003	S_20	SP-030291	008	--	Correction of Measurement Result File Name Definition for alignment with Windows based systems	5.1.0	5.2.0
Sep 2003	S_21	SP-030430	009	--	Addition of <code>ijobId</code> and <code>ireportingPeriod</code> parameters in the file format definition	5.2.0	6.0.0
Sep 2003	S_21	SP-030430	010	--	Removal of measurement job state and status attributes	5.2.0	6.0.0
Sep 2003	S_21	SP-030430	011	--	Refinement of the conditions for setting <code>isuspect flag</code>	5.2.0	6.0.0
Dec 2003	S_22	SP-030755	012	1	Add requirements for Measurement Job overload management	6.0.0	6.1.0
Jun 2004	S_24	SP-040265	015	--	Correction in requirement for granularity periods	6.1.0	6.2.0

## CHANGE REQUEST

⌘ **32.401 CR 020** ⌘ rev - ⌘ Current version: **6.2.0** ⌘

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>	⌘ Add jobld in PM file name		
<b>Source:</b>	⌘ SA5 (lidan@nortelnetworks.com)		
<b>Work item code:</b>	⌘ OAM-PM	<b>Date:</b>	⌘ 20/08/2004
<b>Category:</b>	⌘ <b>B</b>	<b>Release:</b>	⌘ Rel-6
	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>	⌘ When PMIRP is supported, the jobld information is necessary in the PM file name.
<b>Summary of change:</b>	⌘ Add jobld into the PM result file name, provide the corresponding definition and example.
<b>Consequences if not approved:</b>	⌘

<b>Clauses affected:</b>	⌘ Annex B.1.2										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">X</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">X</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">X</td> </tr> </table>	Y	N		X		X		X	Other core specifications	⌘
	Y	N									
		X									
	X										
	X										
		Test specifications									
		O&M Specifications									
<b>Other comments:</b>	⌘										

## Change in Clause B.1.2

### B.1.2 File naming

The following convention shall be applied for measurement result file naming:

<Type><Startdate>.<Starttime>-[<Enddate>.]<Endtime>[\_<jobId>]\_[<UniqueId>][\_<RC>]

- 1) The Type field indicates if the file contains measurement results for single or multiple NEs and/or granularity periods, where:
  - "A" means single NE, single granularity period;
  - "B" indicates multiple NEs, single granularity period;
  - "C" signifies single NE, multiple granularity periods;
  - "D" stands for multiple NEs, multiple granularity periods.

Note that files generated by the NEs will always have the Type field set to "A".

- 2) The Startdate field indicates the date when the granularity period began if the Type field is set to A or B. If the Type field is either "C" or "D" then Startdate contains the date when the first granularity period of the measurement results contained in the file started. The Startdate field is of the form YYYYMMDD, where:
  - YYYY is the year in four-digit notation;
  - MM is the month in two digit notation (01 - 12);
  - DD is the day in two-digit notation (01 - 31).
- 3) The Starttime field indicates the time when the granularity period began if the Type field is set to A or B. If the Type field is either "C" or "D" then Starttime contains the time when the first granularity period of the measurement results contained in the file began. The Starttime field is of the form HHMMShhmm, where:
  - HH is the two-digit hour of the day (local time), based on 24-hour clock (00 - 23);
  - MM is the two digit minute of the hour (local time), possible values are 00, 05, 10, 15, 20, 25, 30, 35, 40, 45, 50, and 55;
  - s is the sign of the local time differential from UTC (+ or -), in case the time differential to UTC is 0 then the sign may be arbitrarily set to "+" or "-";
  - hh is the two-digit number of hours of the local time differential from UTC (00-23);
  - mm is the two digit number of minutes of the local time differential from UTC (00-59).
- 4) The Enddate field shall only be included if the Type field is set to "C" or "D", i.e. measurement results for multiple granularity periods are contained in the file. It identifies the date when the last granularity period of these measurements ended, and its structure corresponds to the Startdate field.
- 5) The Endtime field indicates the time when the granularity period ended if the Type field is set to A or B. If the Type field is either "C" or "D" then Endtime contains the time when the last granularity period of the measurement results contained in the file ended. Its structure corresponds to the Starttime field, however, the allowed values for the minute of the hour are 05, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, and 00.
- 6) UniqueId. This is the name of the NE, EM or domain, as defined in clauses B.1.1.1 and B.1.1.2 (e.g. a distinguishedName). The field may be omitted only if the distinguishedName is not available from the CM applications.
- 7) The RC parameter is a running count, starting with the value of "1", and shall be appended only if the filename is otherwise not unanimous, i.e. more than one file is generated and all other parameters of the file name are identical. Therefore it may only be used by the EM, since the described situation cannot occur with NE generated

files. Note that the delimiter for this field, `_-`, is an underscore character (`_`), followed by a minus character (`-`), followed by an underscore character (`_`).

8) `jobId`. When PMIRP is supported, the `jobId` shall be indicated in the performance measurement file name.

Some examples describing file-naming convention:

1) file name: A20000626.2315+0200-2330+0200\_NodeBId,  
 meaning: file produced by NodeB `<NodeBId>` on June 26, 2000, granularity period 15 minutes from 23:15 local to 23:30 local, with a time differential of +2 hours against UTC.

2) file name: B20021224.1700-1130-1705-1130\_job10\_EMId,  
 meaning: file containing results for multiple NEs, generated for measurement job job10, produced by EM `<EMId>` on December 24, 2002, granularity period 5 minutes from 17:00 local to 17:05 local, with a time differential of `n11:30` hours against UTC.

3) file name: D20050907.1030+0000-20050909.1500+0000\_DomainId\_-\_2,  
 meaning: file containing results for NEs belonging to domain `<DomainId>`, start of first granularity period 07 September 2005, 10:30 local, end of last granularity period 09 September 2005, 15:00 local, with a time differential of 0 against UTC. This file is produced by the EM managing the domain, and it is the second file for this domain/granularity period combination.

**End of Change in Annex B.1.2  
 End of Document**

## Annex D (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
June 2001	S_12	SP-010237	--	--	Submitted to TSG SA #12 for Information.	--	1.0.0
June 2001	--	--	--	--	MCC editorials	1.0.0	1.0.1
Sep 2001	S_13	SP-010467	--	--	Submitted to TSG SA #13 for Approval	2.0.0	4.0.0
Dec 2001	S_14	SP-010638	001	--	Correction of declaration in XML header	4.0.0	4.1.0
Mar 2002	S_15	--	--	--	Automatic upgrade to Rel-5 (no Rel-5 CR)	4.1.0	5.0.0
Sep 2002	S_17	SP-020502	003	--	Description of Alarm IRP usage for performance alarms	5.0.0	5.1.0
Sep 2002	S_17	SP-020502	004	--	Addition of measurement file XML schema and miscellaneous alignments with CM	5.0.0	5.1.0
Jun 2003	S_20	SP-030291	006	--	Clarification of NE file generation behaviour in case of multiple granularity periods	5.1.0	5.2.0
Jun 2003	S_20	SP-030291	008	--	Correction of Measurement Result File Name Definition for alignment with Windows based systems	5.1.0	5.2.0
Sep 2003	S_21	SP-030430	009	--	Addition of <code>jobId</code> and <code>reportingPeriod</code> parameters in the file format definition	5.2.0	6.0.0
Sep 2003	S_21	SP-030430	010	--	Removal of measurement job state and status attributes	5.2.0	6.0.0
Sep 2003	S_21	SP-030430	011	--	Refinement of the conditions for setting <code>suspect flag</code>	5.2.0	6.0.0
Dec 2003	S_22	SP-030755	012	1	Add requirements for Measurement Job overload management	6.0.0	6.1.0
Jun 2004	S_24	SP-040265	015	--	Correction in requirement for granularity periods	6.1.0	6.2.0