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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

Introduction

Public Network Operators (PNOs) and manufacturers use different ways to name and identify telecommunication equipment. This causes difficulties and inefficiency.

Operators have to manage the different formats and contents by which manufacturers identify their product. Operators frequently having to translate these disparate identifiers into internal codes to feed their internal systems with the information needed.

On the other hand, manufacturers are required by some PNOs to deliver their products with the PNOs' proprietary codes and different information. Manufacturers have to manage this information.

The business needs of the PNOs and the manufacturers are different but they do share some common needs. This situation can be rationalized by adopting a manageable unique and global method for the identification of telecommunication equipment. This new identity would link the common needs of both PNOs and manufacturers. It could be used by each to exchange information within inter-company and intra-company processes and workflows.

1 Scope

The present document provides the information for the identification of telecommunication equipment. The present document focuses on both manufacturers and PNOs' needs when exchanging information. This information can be used either externally or internally.

Based on an analysis of the results of a survey [2], the present document identifies the data elements which are considered to be necessary and sufficient to identify equipment. In addition to that, the present document provides associated information which is found useful to be exchanged between manufacturers and PNOs.

The format of the Equipment Identity is out of scope of the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1]   ITU-T Recommendation Y.110: "Global Information infrastructure principles and framework architecture".

[2]   ETSI TR 102 214: "Services and Protocols for Advanced Networks (SPAN); Result of the PNOs and Equipment Manufacturers questionnaires for identification of Equipment Unit".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

assignable equipment: equipment units can be assigned and/or unassigned (partially or wholly) to any type of service, circuit, trunk, or facility being provided or used by the PNO

NOTE: Assignable equipments may have single or multi-assignment capability. Assignable equipment is further defined as a unit of equipment that is an active component or element within the transmission or signalling path of circuits or channels designed through the service provisioning process to provide telecommunications services to the end customers. Assignable equipment includes:

- All hardwired (fixed) equipment, portable equipment, plug-ins, plug-ons, hardwired mountings, shelves and/or backplanes that provide telecommunications services (voice, data, image, video, IP, etc.) for sale, resale, or internal use by the PNO;

- All components used within the transport, transmission, message and signalling paths operated and/or leased by a PNO;

- Any physical or logical telecommunications component that is an inventoried telecommunication item that can be administered by the PNO.

equipment class: grouping of specific equipments that is identified by Globally Generic and Stable Information and for which a unique Equipment Identity can be assigned

equipment supplier: see manufacturer definitions

Equipment Identity (EI): provides information in a uniform, concise and function-oriented format about each equipment unit within its particular network application or environment

> NOTE: The EIs identify both equipment units and equipment mountings and can be used by both PNOs and manufacturers. The EI should be useable in both manual and OSS environments and provide human and machine-readable information. Each Equipment Identity would:
>
> - Describe a specific combination of "Globally Generic and Stable Information" for each equipment unit or mounting;
>
> - Provide or reference equipment with specific equipment attributes, features and technical information.

equipment unit: assembly of one or more components that are wired together to provide one or more specific functions within the network

> NOTE 1: Equipment units can be either assignable or non-assignable and mounted permanently or temporarily on other equipment units.
>
> NOTE 2: Plug-ins, plug-ons, cards, modules, selves/magazines/racks are typical equipment units.

equipment mounting: used to mount, wire, store, test and activate equipment units

> NOTE 1: In ITU-T Recommendation M.3100 the Equipment Mounting is modelled by Equipment holder type: "The equipment holder type attribute indicates the type of equipment holder using a character string. The possible values for the character string may be bay, shelf, drawer, slot and rack".
>
> NOTE 2: Equipment mountings can be assignable or non-assignable and mounted permanently or temporarily on or within other equipment units.
>
> NOTE 3: Typical equipment mountings are, relay racks, equipment bays, cabinets, magazines, shelves, modules, containers, drawers, etc.

Globally Generic and Stable Information (GGSI): consists of no less than a specific instance of the manufacturer's name and the part number and version number that is permanently assigned to each equipment unit by the manufacturer.

> NOTE 1: This information must be consistently applied by the manufacturer to all equipment units prior to shipment and provides a consistent meaning, representation, or description that is generally understood by professional and technical users.
>
> NOTE 2: Stable Information is any data value that is consistent (unchanging) across multiple instances of the same element, feature, or item. Stable Information will change only when the element, feature, unit or item it represents is physically, electrically, or optically altered, revised, or modified and considered to be reasonably different from the preceding instance.

manufacturer, primary: manufacturer of telecommunication equipment that is placed on the market.

> NOTE: A primary manufacturer has the responsibility for the equipment when it comes to warranties and repairs

manufacturer, secondary: vendor that re-brands primary manufacturer telecommunication equipment and places it on the market.

> NOTE: A secondary manufacturer takes over a primary manufacturer's responsibility for warranties and repairs

manufacturer name: name of the business entity that is responsible for the manufacturing and assembly of the equipment unit

NOTE: This name is clearly displayed, etched, or marked on each equipment unit and is part of the equipment identity regardless of the current status of the manufacturer (renamed, dissolved, acquired, etc.). In some instances, due to acquisitions, the identical equipment part and version number may be produced under multiple manufacturer names. manufacturer Name is one of the three primary elements needed to develop an Equipment Identity.

manufacturer ordering code: arbitrary commercial code developed by manufacturers for PNOs.

NOTE 1:   This code can be used by a PNO to order one equipment type, or multiple groups of equipment types from manufacturers and suppliers

NOTE 2:   Manufacturer ordering codes are not marked nor etched on equipment units, nor do they have a one-to-one relationship with manufacturer part numbers.

manufacturer part number: proprietary character string of information that is assigned to each equipment unit by its manufacturer

NOTE 1:   Part numbers can be further described as:

- coding of arbitrary length and format that uniquely identifies a specific equipment unit or equipment mounting;

- coding that may contain some basic information on the purpose or function of the equipment unit or mounting;

- coding that is stamped or etched on each equipment unit or mounting;

- part numbers normally do not identify which version, issue, or release number was used to manufacture the equipment unit.

NOTE 2:   A part number is one of the three primary elements needed to develop an Equipment Identity**.**

NOTE 3:   A Part numbers are not EAN 13 (code used on the packaging for consumer goods).

manufacturer serial number: arbitrary alphanumeric character string using a proprietary format of non-reoccurring data value (changing) that are marked or etched onto each equipment unit or mounting during assembly by the manufacturer

NOTE 1:   It is unique within the context of each manufacturer.

NOTE 2:   It could provide associated information (e.g. manufacturing time) for each equipment unit. Some of the information associated to the serial number changes across multiple instances during the equipment unit life cycle (eg. technical specifications, repair, etc.).

manufacturer equipment version: proprietary information that is assigned to each hardware equipment unit during assembly by the manufacturer

NOTE: It identifies changes (eg. applied during the assembly and testing of equipment units without significantly altering the electrical, optical, external connectivity or physical characteristics) of the manufacturers original equipment unit. Version is one of the three primary elements needed to develop an Equipment Identity.

Management Information Base (MIB): software feature embedded within a system by the manufacturer

NOTE   It provides specific information in a software format on an equipment unit. The information contained in a MIB is determined by the manufacturer and is retrievable via a management interface

non-assignable equipment: non-assignable equipment supports but does not directly provide (partially or wholly) any type of customer or company service, circuit, trunk, or facility

NOTE: Typical non-assignable equipment would be jack panels, fuse equipment.

plug-in: item of electronic equipment that connects its circuit elements to other equipment, affects the operation of that equipment and is considered to be replaceable or easily removed

NOTE 1: In ITU-T Recommendation M.3100, The circuit pack object class is a class of managed objects that represents a plug-in replaceable unit that can be inserted into or removed from the equipment holder of the network element. Examples of plug-in cards include line cards, processors and power supply units.

NOTE 2: A plug-in is dependent on another equipment to complete its. A plug-in may connect to other equipment by means of circuit connectors imprinted on the edge of a circuit board that mate to a chassis backplane connector.

plug-on: plug-on equipment plugs onto a "plug-in" equipment unit and is sometimes referred to as a "daughter board" or "child board"

NOTE: A plug-on may complete the function of a plug-in or provide additional functions with hardware, software, or both. It is generally marked with and ordered by its own part number.

Public Network Operator (PNO): business entity that sells and/or resells telecommunication services to the public or other service providers

NOTE: These services can include wireline, wireless, and IP networks that provide residential services, business services, data services, private line services, Internet services and/or long distance services.

sub-supplier: business entity that delivers components to manufacturers (primary or secondary) which are then integrated into their equipment

updateable firmware: closely linked with hardware. Equipment units may rely on firmware updates

updateable hardware: telecommunication units can be multi-functional and rely on hardware updates

updateable software: telecommunication equipment units can be multi-functional and may rely on software updates having predetermined parameters to activate internal features

NOTE: Software updates can be made from external sources such as floppy disks, tapes, cartridges and compact disks, OSSs, etc.

vendor: business entity that sells or resells equipment units, mountings and services to PNOs, but does not manufacture equipment

NOTE: Also refers to the secondary manufacturer definition.

3.2 Abbreviations

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

EAN	European Article Number
EI	Equipment Identity
GGSI	Globally Generic and Stable Information
HWT	Hardware Traceability
IPQM	In Process Quality Metrics
MIB	Management Information Base
MTBF	Mean Time Between Failure
MTTFF	Mean Time To First Failure
MTTR	Mean Time To Repair
O&M	Operations and Maintenance
OSS	Operations Support System
PNO	Public Network Operator
PO	Purchase Order
QM	Quality Monitoring
RQMS	Reliability and Quality MeasurementS
SDoC	Supplier Declaration of Conformity
TEI	Telecom Equipment Identity
TMF	TeleManagement Forum

4 Business role model

4.1 Introduction

In order to illustrate the need for a uniform approach to equipment identification, the present document uses the business role model approach. This approach is used by ITU-T in Recommendation Y.110 [1] under the term "Enterprise Model". This approach follows from the observation that the interactions in a business environment usually lead to a sequence of activities: goods or services are produced, they are traded, intermediate parties may provide added value to them, and finally they are consumed. This sequence of activities is called a *value chain*, the involved business entities are called *actors*, and the activities of the actors are called *roles*.

Refer to ITU-T Recommendation Y.110 [1], clause 6.1, for an informal introduction into this modelling approach.

4.2 Composition of the business role model

4.2.1 Roles

The product under consideration in the present document is telecommunication equipment. In the value chain which describes the flow of this equipment from producer to consumer, the following roles are recognized:

- primary manufacturing: this role comprises the composition of equipment from parts and semi-manufactured articles. The output of this role is commercially tradable equipment which can be put on the market, or be input to secondary manufacturing;

- secondary manufacturing: this role comprises the act of acquiring equipment from the primary manufacturing role, rebranding it and putting it on the market;

- retailing: this role comprises the act of selling and reselling equipment to the customer;

- consumption: this role comprises the act of incorporating the equipment by an entity to use it in its business role: providing telecommunications services;

- repairing: this role comprises the treatment of failed equipment such that it can reused for its intended purpose;

- sub-supplying: this role comprises the delivery of components to manufacturers (primary or secondary) which are then integrated into their equipment;.

- trusted third partyintermediary: this business role provides services (e.g. outside consulting and engineering) that facilitates the interaction between any actor.

4.2.2 Value chain

The value chain made up by these roles is depicted in figure 1. Equipment is manufactured and subsequently sold to the consumer, either directly or via the intermediate roles of secondary manufacturing and/or reselling. If the equipment fails it can be sent back to the manufacturer for repair (again, either directly or indirectly) or to a specialized repair shop. If the equipment reaches end of life, it can be sent back to the manufacturer (takeback).
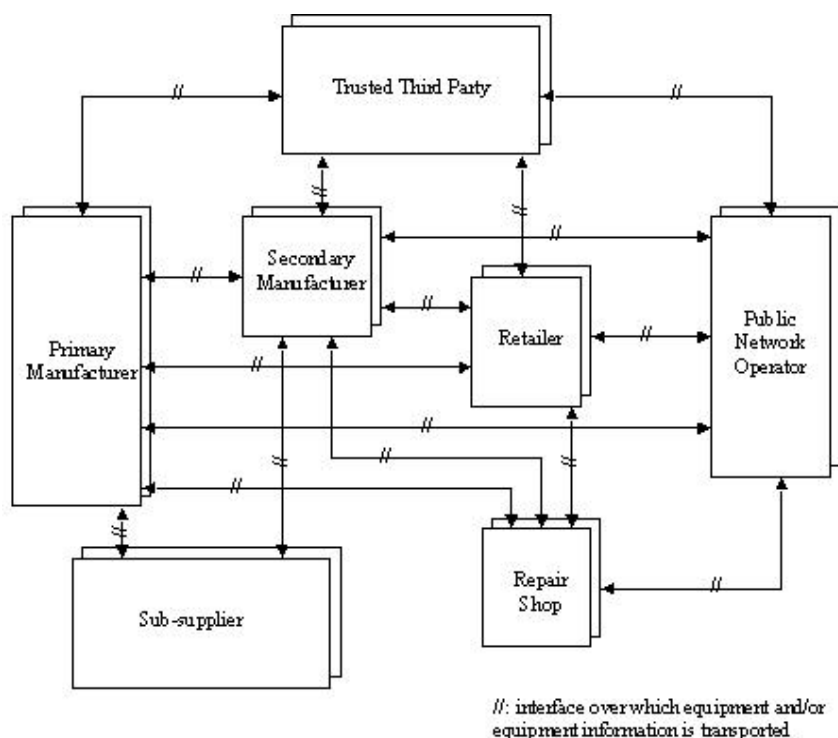
Figure 1: Equipment Value Chain

4.2.3   Actors

Actors are the entities which play the roles. Very generally speaking, all identified roles could be played by a single actor. In a competitive business environment, these roles are usually played by different commercial entities. In general, the following actors can be distinguished: primary manufacturers, secondary manufacturers, retailers, repair shops, trusted third party and PNOs. Note that this does not mean that there should be an independent commercial entity for each role, e.g. the primary manufacturer role and the repair shop role could very well be played by the same actor.

4.2.4   Interfaces

From figure 1, a number of interfaces between actors can be identified, over which business transactions involving equipment are being executed. These transactions can include physically handing over equipment from one actor to another, e.g. transferring equipment from a manufacturer's warehouse to a PNO's telecom station. There exist also logical transactions without involvement of physical equipment, e.g. a PNO ordering additional copies of the installation manual for a particular type of equipment. In both cases, the involved actors should be able to unambiguously identify the equipment which is subject of the business transaction.

Equipment identification provides the means for such unambiguous identification.

4.3   Conclusion: need for uniform Telecommunication Equipment Identification (TEI)

The liberalization of service provisioning and network operations has caused a profound change in the nature of the business relationships in the telecommunications sector. These relationships evolved from the classical "one service provider, buying equipment from three suppliers' model towards a complicated, ever changing network of primary manufacturers, secondary manufacturers and resellers, serving an increased number of public network operators.

In such environment, where all parties have to interact with a large, continuously changing set of other parties, standardization of parameters exchanged over the interfaces between the parties will be beneficial to all involved. The next clause illustrates this from the point of view of the PNOs.

Business processes which are conducted completely inside a single commercial entity may also benefit from uniform equipment identification.

5 PNOs processes making use of Equipment Identity information

The following information is based on TR 102 214 [2] review of PNO needs for equipment identity and EURESCOM Study P619, D5 and D6 (see bibliography). This clause outlines the PNO advantages and requirements for an Equipment Identity (EI) and the type of support required from the manufacturer .

Sharing of EI data can permit the PNO and manufacturer to exchange equipment information in a uniform fashion and facilitate inter-company transactions. In addition, the EI database can also be used by the PNOs to uniform and improve equipment related workflows within their internal processes. Several areas where PNOs could benefit from EI data are:

- engineering;
- acquisition;
- inventory Management;
- provisioning;
- Operation and Maintenance (O&M);
- quality Monitoring;
- logistics;
- administration.

The following clauses describe the PNOs' processes, some of their needs and advantages gained by using EI information.

5.1 Engineering process

Advantages:

PNO Engineers plan, reconfigure, upgrade and order equipment for network systems well in advance of customer needs. Engineering groups can utilize EI information within their OSSs to plan network designs and project network capacity. Some of the benefits from EI data are:

- automate engineering processes;
- shorten engineering intervals and reduce PNO costs;
- facilitate network designs, retrofits and upgrades;
- standardize engineer, furnish, and install specifications;
- facilitate the transfer of network information to other work groups;
- improve equipment requests procedures for procurement;
- provide more detailed information in engineering and inventory records.

Recommendations:

Engineering staff should have access to EI database and be trained in the proper use of this information. EI data should be used to update engineering records and to provide complete equipment information in a uniform fashion to other work groups and processes.

Data Needed:

a. Manufacturer Name
b. Manufacturer Part Number
c. Manufacturer Equipment Version

    d. Manufacturing Ordering Code
    e. Port or circuit rate
    f. Physical Dimension
    g. Physical Description
    h. Physical Weight
    i. Electrical Requirements
    j. Alarm Features
    k. Hazardous Materials
    l. Downloadable Software
    m. Equipment Slot Requirements
    n. Equipment Slot Location
    o. Maximum Allowable Slots
    p. Total quantity of physical slots
    q. Product Structure
    r. Installation Environment
    s. Installation Wiring and Cabling
    t. Product Description
    u. Equipment Function and Features
    v. General Application of Equipment Units
    w. Technical Information
    x. Interchangeable Equipment
    y. Compatible Equipment
    z. Extractable MIB data
    aa. Compliance SDoC and National Standards

5.2 Acquisition process

Advantages:

The EI database can function as part of the technical interface used by PNO Procurement groups to order and exchanged equipment information in a uniform fashion with the manufacturer .

Acquisition can benefit from EI data:

- uniform equipment requests from engineering;

- improved use of supplier qualification and monitoring data;

- facilitate equipment orders;

- track, confirm and reconcile Purchase Orders (POs) and invoice data;

- track equipment movements with manufacturers and within the PNO's organization;

- equipment warranty, replacement and/or repair by manufacturer .

The requirements for the use of EI information in inter-company transactions and activities should be clearly stated, understood and agreed to by both the PNO and manufacturer .

Recommendations:

The manufacturer should attach EI data to the equipment and provide the EI database at the time of delivery to the PNO. Procurement staff needs access to the EI and HWT databases and be trained in the proper use of this data. Both the PNO and manufacturer should strive to incorporate EI data into all inter-company equipment transactions and use this data to automate processes wherever possible.

Data needed:

    a. Manufacturer Name
    b. Manufacturer Part Number
    c. Manufacturer Equipment Version
    d. Manufacturing Ordering Code
    e. Hardware Traceability
    f. Product Description

g. General Application of Equipment Units
h. Manufacturer Recondition or Repaired Equipment
i. Change Management
j. Interchangeable Equipment
k. Compatible Equipment
l. Human Readable Information
m. Machine Scanable Information
n. General application of equipment units
o. Manufacturer Equipment Software Version Number
p. Manufacturer Equipment Firmware Version Number
q. End of Warranty Period
r. End of Equipment Serviceability
s. Product Name
t. Equipment Availability from Manufacturer

5.3 Inventory Management

Advantages:

PNOs need to manage equipment information from multiple manufacturers within their OSSs and processes. These PNO processes can benefit from direct access to an equipment database that consistently provides all needed information in a uniform format. Selected elements of EI information can be used to create inventory data. These data can be accessed by multiple OSS to plan, provision and manage the PNO network and services.

Inventory management can benefit from EI data:

- rapid access to technical data for all equipment types;

- data validation;

- improved automation during inventory creation and assignment;

- improved accuracy in equipment inventories;

- improved field inventory validation and audits (scanned or manual);

- facilitates transfer of equipment information between OSSs;

- facilitates provisioning and warehouse equipment transactions.

Engineering, provisioning, and O&M functions (described in other clauses) can benefit from an inventory management system with access to detailed information on equipment attributes and capabilities.

Recommendations:

The PNOs should have consistent source of up to date EI data that uniformly provides all the equipment information needed by their OSSs, internal and external processes. PNO staff responsible for inventory management should have access to EI databases and training on the proper use of this data.

Data needed:

a. Manufacturer Name
b. Manufacturer Part Number
c. Manufacturer Equipment Version
d. Port or circuit rate
e. Hazardous Materials
f. Downloadable Software
g. Equipment Slot Requirements
h. Equipment Slot Location
i. Total quantity of physical slots
j. Installation Wiring and Cabling
k. Product Description
l. Equipment Function and Features
m. Technical Information

n. Change Management
o. Interchangeable Equipment
p. Compatible Equipment
q. Human Readable Information
r. Machine Scanable Information
s. Manufacturer Equipment Software Version Number
t. Compatible Equipment Software
u. Manufacturer Equipment Firmware Version Number
v. Compatible Equipment Firmware
w. End of Warranty Period
x. Extractable MIB data
y. Product Name

5.4   Provisioning

Advantages:

Provisioning staffs are responsible for making equipment assignments that optimize network capacity, provide the least cost and satisfy customer demands for service. The provisioning process begins with matching of equipment to operational requirements.

Provisioning can benefit from EI data:

- identify equipment that satisfies the service;

- equipment available for assignment;

- optimize equipment costs (e.g. using the equipment having the least cost able to deliver the service);

- interchangeable equipment (hardware, software, firmware);

- full utilization of all equipment units.

Provisioning centres may have a limited time to satisfy a service request and can benefit from an EI database that provides rapid access to all needed equipment information.

Recommendations:

The PNOs should have a consistent source of EI data that uniformly provides all the information needed by their OSSs, internal and external processes. Those responsible for service and circuit provisioning should have easy access to EI databases and training on proper use of this data.

Data needed:

a. Manufacturer Name
b. Manufacturer Part Number
c. Manufacturer Equipment Version
d. Port or circuit rate
e. Downloadable Software
f. Product Structure
g. Installation Wiring and Cabling
h. Product Description
i. Equipment Function and Features
j. Technical Information
k. Interchangeable Equipment
l. Compatible Equipment
m. General Application of equipment
n. Compatible Equipment Software
o. Compatible Equipment Firmware
p. Product Name.

5.5   Operation and Maintenance (O&M) process

Advantages:

O&M has an integral role in ensuring quality service to customers. Their responsibilities include the activation, assignment, testing, maintenance, repair and replacement of equipment. Frequently these O&M activities may be performed within limited timeframes and in adverse conditions.

O&M can benefit from EI data:

- facilitate the installation, testing and activation of equipment;

- equipment maintenance, upgrades and repairs;

- firmware and software downloads;

- network monitoring/surveillance;

- identifying equipment with abnormal fail rates or reoccurring faults;

- locating and replacing faulty equipment;

- repair and maintenance of equipment;

- inventory validation and equipment movement;

Recommendations:

O&M should ensure that PNO records are updated with accurate EI information following any operation that installs new or replaces equipment. O&M staff should have access to EI (and possibly HWT) databases and trained on how to use this data properly

Data needed:

a.   Manufacturer Name
b.   Manufacturer Part Number
c.   Manufacturer Equipment Version
d.   Hardware Traceability
e.   Port or circuit rate
f.   Physical Weight
g.   Electrical Requirements
h.   Alarm Features
i.   Testing Information
j.   Hazardous Materials
k.   Downloadable Software
l.   Product structure
m.   Installation Wiring and Cabling
n.   Product Description
o.   Equipment Function and Features
p.   Manufacturer Recondition or Repaired Equipment
q.   Technical Information
r.   Interchangeable Equipment
s.   Compatible Equipment
t.   Human Readable Information
u.   Machine Scanable Information
v.   Extractable MIB data
w.   Manufacturer Equipment Software Version Number
x.   Compatible Equipment Software
y.   Manufacturer Equipment Firmware Version Number
z.   Compatible Equipment Firmware
aa.   End of Equipment Serviceability

5.6 Quality Monitoring (QM) process

Advantages:

Quality groups need uniform equipment information that can assist them in the monitoring and evaluating equipment behaviour and reliability. These PNO metrics should include equipment performance and failure rates that can be associated with modifications and improvements introduced by the manufacturer during production.

Typical examples of PNO metrics are:

- Mean Time To First Failure (MTTFF);

- Mean Time To Repair (MTTR);

- Mean Time Between Failures (MTBF);

- time in service;

- productss that have exceeded a predefined threshold of failures;

- monitoring the life cycle of equipment;

- Reliability and Quality Measurements (RQMS);

- In-Process Quality Metrics (IPQM).

EI data can provide a reliable source of information that can be used by the PNO during the development of performance metrics for equipment.

Recommendations:

The PNO should have EI data in a format that can be used with HWT data to accurately identity, locate and evaluate the equipment performance from different manufacturers. The QM team should have access to the EI database and be trained on how to use this data properly.

Data needed:

a. Manufacturer Name
b. Manufacturer Part Number
c. Manufacturer Equipment Version
d. Hardware Traceability
e. Testing Information
f. Product structure
g. Product Description
h. Equipment Function and Features
i. General Application of Equipment Units
j. Manufacturer Recondition or Repaired Equipment
k. Technical Information.
l. Change Management
m. Human Information
n. Machine Scanable Information
o. Manufacturer Equipment Software Version Number
p. Manufacturer Equipment Firmware Version Number
q. End of Warranty Period
r. End of Equipment Serviceability
s. Extractable MIB data
t. Product Name

5.7   Logistics process

Advantages:

PNOs can use EI data as part of the logistical information used to manage equipment within their network and warehouses. Some areas where logistics can benefit with EI data are:

- identification and tracking of PNO equipment assets;

- identification of working, spare and warehoused equipment;

- supplement statistical data in equipment service and dependability studies;

- storage and warehouse requirements;

- transporting equipment.

Recommendations:

The PNO may not achieve full advantage of EI information unless the manufacturer attaches it in consistent method to all equipment at the time of delivery. In addition, EI information should also be provided on equipment shipping containers to accurately identify quantity and contents.

Data needed:

a. Manufacturer Name
b. Manufacturer Part Number
c. Manufacturer Equipment Version
d. Hardware Traceability
e. Port or circuit rate
f. Equipment Slot Requirements
g. Equipment Slot Location
h. Maximum Allowable Slots
i. Total quantity of physical slots
j. Product structure
k. Product Description
l. Equipment Function and Features
m. General Application of Equipment Units
n. Interchangeable Equipment
o. Compatible Equipment
p. Human Readable Information
q. Machine Scanable Information
r. Extractable MIB data
s. Manufacturer Equipment Software Version Number
t. Compatible Equipment Software
u. Manufacturer Equipment Firmware Version Number
v. Compatible Equipment Firmware
w. Product Name

5.8   Administrative process

Advantages:

PNO administrative processes may use EI (and possibly HWT) data to automate and collect asset information for PNO accounting and financial statements. Typical benefits for Administration processes are:

- identify equipment quantities by type and version;

- calculate the value of working, spare, or obsolete equipment;

- identify equipment by class of asset;

- identify equipment by location.

Recommendations:

Administrative staff should have access to EI database and be trained on the proper use of this information.

Data needed:

- a.   Manufacturer Name
- b.   Manufacturer Part Number
- c.   Manufacturer Equipment Version
- d.   Hardware Traceability
- e.   Total quantity of physical slots
- f.   Product Structure
- g.   Product Description
- h.   Equipment Function and Features
- i.   General Application of Equipment Units
- j.   Manufacturer Recondition or Repaired Equipment
- k.   Change Management
- l.   Human Readable Information

6   Manufacturers' processes using EI Information

Manufacturers may gain advantages from EI information in three different processes:

- manufacturing and sales

- installation

- repair and maintenance

The following clauses describe manufacturers' processes, some of their needs and advantages gained by using EI information.

6.1   Manufacturing and sales process

Advantages:

EI should enable identification of the original manufacturer of a product in warranty cases. In case there are a primary and a secondary manufacturer the name (identity) allows HWT back to the primary manufacturer even if the secondary manufacturers' name is placed on the product. This is also true in the case of relations with sub-suppliers. Connecting order number to product number and version through the serial number allows HWT of products delivered in a certain customer order.

Recommendations:

Sub suppliers and/or secondary manufacturers should update the secondary or primary manufacturers' HWT database.

Data needed:

- manufacturer name;

- part number;

- product version;

- serial number;

- traceability structure;

- manufacturing time;

- customer order number;

- shipment date;

- warranty time (e.g. length of warranty).

6.2   Installation Process

Advantages:

One of the most important needs of the Installation Process is to identify the localization of the product at the customer. Information about localization of the product is valuable in case of any need to recall products due to discovered faults. If information about time for installation and/or acceptance is provided the correct warranty time can be calculated.

Recommendations:

Information should be updated in the manufacturers' HWT database in case of any changes from the original configuration based on customer order.

Data needed:

- manufacturer name;

- part number;

- product version;

- serial number;

- traceability structure;

- customer name;

- product localization;

- installation time;

- acceptance time.

6.3   Repair and maintenance process

Advantages:

Manufacturers can improve design of the product based on performance of products in use. From collected information MTTFF, MTTR and MTBF can be calculated.

Recommendations:

Information about changes in the field and at repair centres should be updated in the manufacturers' HWT database.

Data needed:

- manufacturer name;

- part number;

- product version;

- serial number;

- traceability structure;

- warranty time (e.g. when does warranty ends);

- repair centre;

- number of repairs;

- information on Interchangeability;

- scrap information.

7 Components of the equipment identity and associated attributes

A study was conducted to gather the information required by PNOs and manufacturers to identify their telecommunication equipment. The results of this study are detailed in [2]. The following information is based on an evaluation of the results.

7.1 Equipment Identity

The combination of the three following components can be used to provide a single identity for an equipment unit.

- manufacturer name;

- manufacturer partnumber;

- manufacturer equipment version number.

Serial number is not to be used as part of an Equipment Identity. It can be used for specific external or internal processes (e.g. repair tracking by the serial number).

7.2 Information associated with the equipment identity

This information will feed manufacturers and PNOs internal and/or external processes and allow them to get greater value. This added value is achieved by linking the Equipment Identity and the associated information, also referred to as "Attributes".

An attribute could be considered as globally generic and stable. This means that the following would not be an attribute:

- all information which is specific to an operator (e.g. warranty);

- all information which is specific to a manufacturer (e.g. Repair centre);

- all information that can change over a period of time (e.g. production time, manufacturer ordering code).

The following associated information, when technically relevant, should be provided by a manufacturer for use in the PNOs' databases:

- port or circuit rate. identify all bit rates, speed, or other special engineering features associated with the equipment unit (no change compared to TR 102 214 [2]);

- physical dimensions. identify the metric length, height, width and shape of the equipment unit (no change compared to TR 102 214 [2]);

- physical description. describe the type of assets, and whether the equipment unit is a plug-in, plug-on, mounting, shelf, bay, rack, cabinet, etc. (no change compared to TR 102 214 [2]);

- physical weight. provide the metric weight of the unit (less shipping container). This information is for human and/or structural limit. (no change compared to TR 102 214 [2]);

- electrical requirements. reference the manufacturer's specifications for current type, cycles per second, voltage, power consumption, fusing requirements, etc. (no change compared to TR 102 214 [2]);

- alarm features. reference the manufacturer's recommended specifications for equipment unit alarms (no change compared to TR 102 214 [2]);

- hazardous materials. alert the PNO that there is a manufacturer's hazardous material warning. (no change compared to [2]);

- downloadable software (and firmware) feature. this would identify that the equipment unit is capable of receiving down loadable software from an external source (no change compared to [2]);

- equipment slot requirements. specify the quantity of slots required to install the equipment unit. (no change compared to [2]);

- total quantity of physical slots available based on equipment slot requirement (based on Attribute #9). identify the total number of slots being provided by the equipment mounting;

- installation environmental: identifies acceptable conditions for equipment installation application (exterior, interior, dry, wet, dust free, etc.) (no change compared to [2]);

- installation, wiring and cabling. reference manufacturer's recommended wiring for the equipment. Examples are coaxial cabling fiber-in/fiber-out, etc.;

- product description. brief description of the equipment unit (i.e. power, alarm, interface, etc). (no change compared to [2]);

- general application of equipment units. identifies the general application or asset grouping for the equipment unit. Examples are general power, transmission/transport, switching, access, etc. (no change compared to [2]);

- equipment function or features. engineering and design information that describes the specific roles, functions, or multi-functions of the equipment unit. Examples are PDH or SDH multiplexing, connectors, etc (no change compared to [2]);

- technical information. reference to equipment and assembly drawings, circuit schematics, circuit description, etc. (no change compared to [2]);

- change management. provide information needed to identify and track equipment changes made during the production of equipment. (no change compared to [2]);

- interchangeable equipment. provide the ability to easily identify interchangeable "like-for-like" equipment of the same manufacturer. (changed compared [2]);

- compatible equipment. identify the "downward compatibility" of equipment. Downward is a single direction, and implies that only a newer version can be used to replace a prior version, and not vice versa. If possible the limits to the downward compatibility could be mentioned. (changed compared [2]);

- product name given by the equipment supplier (no change compared to [2]);

- SDoC: Supplier Declaration of Conformity. list of mandatory standards the Equipment unit is compliant with when the equipment unit is to be placed on a specific market (changed compared [2]);

- product structure. is a list and/or structure of components included in the equipment unit. For example: product consists of 2 items of product B and 2 pieces of product C;

NOTE: The information about the localization (e.g. geographical, logical) is not considered to be part of the Equipment identification of each single piece of equipment.

Annex A (informative):
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History

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