OFFER FOR COLLOCATION 2004

GENERAL
TECHNICAL MANUAL

Changes from previous version[1]

Added

Paragraph	Remarks	Issue[2]
3.2.5	Power capability and Fuse possibilities	
3.2.8	Climate conditions within a collocation space (heat dissipation (item is not new), air ventilation, air humidity)	
3.2.14	IS/RA point specifications	
3.3.10; 3.3.11	Disperse of generated heat outside the Service Taker cabinets.	
3.3.12	Maximum noise production of Service Taker Equipment.	
5.1	Tie Cable specifications	

Changed

Paragraph	Remarks	Issue[2]
3.2.7.2	KPN added into the article	
Voettekst	Changed version from 2.0 to 2.1	
Various	Colours to various definitions, services and documents	

Removed

Paragraph	Remarks	Issue[2]

[1] Grammatical changes have not been indicated.

[2] See "Reply issues RO2001 collocation 3rd phase.xls"

GENERAL TECHNICAL MANUAL - CONTENTS

1 Introduction

1.1.1 This General Technical Manual describes the general technical specifications applicable to all the KPN Telecom Collocation Services.

1.1.2 The principles of this General Technical Manual are:

i. specifications are as much as possible in conformance with international and national standards;

ii. KPN specifications will be applicable in the absence of international and national standards and in instances where items are specific to KPN's access network;

iii. the values of the parameters should be measurable by both parties and the method of measurement should be according to international standards.

1.1.3 Terms of which the first letter is capitalised are defined in General or Service Specific Definitions.

1.1.4 This document presents the General Technical Manual applicable to the KPN Telecom Collocation Services provided by KPN to Service Taker, as used in the Framework Agreement, Individual Agreements, and supporting manuals and schedules.

1.1.5 The addressed technical elements in this document apply for all KPN Telecom Collocation Services.

1.1.6 Elements that are specific for the separate KPN Telecom Collocation Services will be addressed in separate documentation.

For each of the KPN Telecom Collocation Services the following documents will be available:

- Definitions
- Service Description
- Tariff Schedule
- Billing Manual
- Operations and Maintenance Manual
- Technical Manual
- Parameter Schedule
- Service Schedule

2 Scope

2.1.1 This General Technical Manual defines the general technical specifications:

i. for Collocation Facilities to be provided by KPN;

ii. for Service Taker Equipment to be placed in the Physical Collocation Space and;

iii. relating to Facilities Links.

2.1.2 Specifications specific to individual Service Facilities and specific requests for collocation will be provided in the Site Report.

3 KPN Collocation Facilities and Service Taker Equipment

3.1 General requirements

3.1.1 Health and safety

3.1.1.1 Service Taker Staff and Service Taker Equipment shall comply with the requirements specified in SI-212219010, 'General Safety and Environmental Requirements for Equipment and Materials' [Appendix I]. These state requirements relating to the sound level, electrical safety and earth leakage, construction, fire hazard, corners and edges of housings, moving and vibrating parts, warm and hot parts and light sources.

3.2 KPN Collocation Facilities

3.2.1 asic 230 VAC power supply for Non-Operational Equipment

3.2.1.1 One basic 230 VAC double wallsocket will be provided in the Collocation Space for the connection of Non-Operational Equipment only.

3.2.1.2 The basic 230 VAC power supply is made available in accordance with the connection conditions of the local electricity distribution company that supplies the power. In the event of an interruption in the supply of electricity, the supply will not be taken over by a different electricity source.

3.2.1.3 No guarantee is offered with regard to the maximum duration of an interruption in the supply of electricity as this depends entirely on the electricity distribution company.

3.2.2 230V AC un-monitored power supply

3.2.2.1 One interface point will be provided in the Collocation Space for 230V AC 'unmonitored' power supply of Operational Equipment.

3.2.2.2 The 230V AC un-monitored power supply is made available in accordance with the connection conditions of the local electricity distribution company that supplies the power. 'Unmonitored' means that in the event of an interruption in the supply of electricity, the supply will not be taken over by a different electricity source.

3.2.2.3 No guarantee is offered with regard to the maximum duration of an interruption in the supply of electricity as this depends entirely on the electricity distribution company.

3.2.2.4 KPN will provide a distribution cabinet (NEN1010) in the Collocation Space.

3.2.2.5 Service Taker is responsible for the fuses in the distribution cabinet.

3.2.2.6 KPN is responsible for the main fuse that feeds the distribution cabinet.

3.2.3 230V AC monitored power supply

3.2.3.1 One interface point will be provided in the Collocation Space for 230V AC monitored power supply of Operational Equipment.

3.2.3.2 The 230V AC monitored power supply is provided with backup by means of an emergency generator. 'Monitored' means that in the event of an interruption in the supply of electricity, the supply will be taken over by a different electricity source.

3.2.3.3 The maximum duration of an interruption in the supply of electricity by 230V AC monitored power supply is 8 seconds.

3.2.3.4 KPN will provide a distribution cabinet (NEN1010) in the Collocation Space.

3.2.3.5 Service Taker is responsible for the fuses in the distribution cabinet.

3.2.3.6 KPN is responsible for the main fuse that feeds the distribution cabinet

3.2.4 48V DC no-break power supply

3.2.4.1 One interface point will be provided in the Collocation Space for 48V DC no-break power supply of Operational Equipment.

3.2.4.2 The 48V DC no break power supply is in accordance with ETS 300 132-2 Power supply interface at the input of the telecommunications equipment; Part 2.

3.2.4.3 The maximum duration of an interruption in the supply of electricity by 48V DC no-break power supply is 0,8 seconds.

3.2.4.4 KPN will provide a distribution cabinet in the Collocation Space.

3.2.4.5 Service Taker is responsible for the fuses in the distribution cabinet.

3.2.4.6 KPN is responsible for the main fuse that feeds the distribution cabinet

3.2.5 Po er c p bilit nd Fuse possibilities

3.2.5.1 If Service Taker has a power connection for (un)monitored power or for a no break (230V, 48V or 400V) power connection, the zero reference current (Nulstroom) is never allowed above 80%of the fuse value of the power supply of Service Taker. This rule also applies to a three-phase (3 fase) power supply of Service Taker.

3.2.5.2 The measuring of the total of power capability is in Kilowatt (KW). Service Taker must take into account the possible growth of its expected power usage. The total power capability necessary for Service Taker is called "contracted power capability" (Gecontracteerd Vermogen) and will be according to the Collocation contract.

3.2.5.3 The contracted power capability (Gecontracteerd Vermogen) will be delivered by KPN to Service Taker. If necessary, and possible, KPN will expand its power capability to insure the delivery of the contracted power capability to Service Taker.

3.2.5.4 The standing energy charge (Vastrecht Energie) will be yearly calculated based on the contracted power capability (Gecontracteerd Vermogen).

3.2.5.5 The maximum power capability (Aansluitvermogen) will be calculated by KPN based on the connected energy power value (Aansluitwaarde) and the contracted power capability (Gecontracteerd Vermogen).

3.2.5.6 The connected energy power value (Aansluitwaarde) will match the fuse that will be used to connect Service Taker Equipment. The connected energy power value (Aansluitwaarde) will be calculated by KPN based on the contracted power capability (Gecontracteerd Vermogen). The measuring of the connected energy power value (Aansluitwaarde) is in Ampère.

3.2.5.7 Based on the result of the calculation of the connected energy power value (Aansluitwaarde) the fuse that will be used to connect Service Taker Equipment is always one category heavier than the outcome of the calculation.

3.2.5.8 If the calculated fuse value for Service Taker Equipment lies between two possible fuse options, the next higher fuse value must be used.

3.2.5.9 List of possible fuse options in a Service Facility.

4	6	10	16	25	35	50	63	80	100	125	160	200	250	315	355	400	500	630	1000

3.2.6 Electrical Earthing Point

3.2.6.1 For each cabinet, an electrical earthing point will be provided.

3.2.6.2 The earthing system will be the MESHed Bonding Network (MESH-BN) system be in accordance with ETS 300 253.

3.2.6.3 The minimum earthing facility is a ring line in the Collocation Space that has multiple links to the building-based earthing facilities. For further details on the minimum earthing facility, refer to ETS 300 253 and ITU-T recommendation K27. This facility can be described as a 'common bonded' earthing network.

3.2.6.4 The earthing system of a 48VDC energy supply that already exists or is to be installed is made available in accordance with the DC/C system.

3.2.7 Climate Control

3.2.7.1 Climate control provided by KPN in the Service Facility will be in compliance with ETSI 300 019-1-3 class 3.1

3.2.8 Climate Conditions within a collocation space

3.2.8.1 The specifications in this paragraph are valid for a KPN controlled Collocations Space within a Service Facility. This excludes e.g. climate conditions within an Adjacent or a Streetcabinet. The mentioned specifications are within the already specified and valid ETSI regulations for this Agreement. KPN and Service Taker can agree different climate conditions for special locations.

3.2.8.2 The specified climate conditions in a Collocation Space are based on an unmanned Collocation Space in a Service Facility. For the climate conditions within a Collocation Space the average temperature (within a bandwidth) and the accompanying relative air humidity will be taken into account according to the ''European Telecommunication Standard Institute'' (ETSI) document with the code ETS 300 019-1-0 en ETS 300 019-1-3.

3.2.8.3 The maximum speed of the air temperature change in a Collocation Space is 0,5 °C per hour.

3.2.8.4 Within the range as specified in this paragraph the average air temperature within a Collocation Space is 28 °C.

3.2.8.5 The specified climate must be measured within the Collocation Space at ¾ of the height of the installed equipment (with a maximum measuring height of 2 meters) in that Collocations Space and on a horizontal distance of 0,4 meter form the installed equipment.

3.2.8.6 The relative air humidity within a Collocation Space must be between a minimum of 10%and a maximum of 90%

3.2.8.7 The ventilated air in a Collocation Space will not be used for recirculation, but will be transported outside the Service Facility. KPN can choose to win back the heat form the ventilated air.

3.2.8.8 The air outside the Service Facility, which is necessary to let in for an effective ventilation of the Collocation Space, will be filtered with a filter with a filter quality of EU7.

3.2.8.9 The ventilation of the air inside the Collocation Space will be according to the Dutch building regulations (Bouwbesluit). The ventilation of the air inside the Collocation Space will be 0,5 per hour.

3.2.9 ESD-safe floor

3.2.9.1 The Collocation Space will be provided with an ESD-safe floor. In case the height of the Service Facility is not sufficient for a raised computer floor an ESD-safe fixed floor will be provided.

3.2.9.2 The floors may be subjected to uniformly distributed loads of maximum 5500 N/ m².

3.2.9.3 Load concentrations must be calculated in each individual case to check conformity with the floor loading limitations of specific Service Facilities.

3.2.9.4 Service Taker Equipment should present an evenly distributed floor load.

3.2.10 Fire detection and protection

3.2.10.1 The fire detection and protection provisions are dependent on the type of Service Facility and on local regulations.

3.2.10.2 The Service Facility will be provided with one of the following fire detection systems:

i. smoke-alarms connected to a burglar-alarm system;

ii. smoke-alarms connected to a fire-alarm installation in accordance with NEN 2535-96;

3.2.10.3 The transmission delay of the fire alarm will be in accordance with category DM1 conform NEN-EN 50136-1-1.

3.2.10.4 The Service Facility will be provided with at least one fire extinguisher.

3.2.11 On-site ESD safety measures

3.2.11.1 At the entrance to the Collocation Space an ESD-tester with floor plate will be provided.

3.2.12 Lighting

3.2.12.1 The lighting installation in the Collocation Space will be in accordance with NEN 1890.

3.2.12.2 A standard lighting of 300 lux will be provided in the Collocation Space.

3.2.12.3 Emergency way-outs will be lighted with at least 1 lux at floor level.

3.2.13 Access control

3.2.13.1 Access to the Collocation Space will be provided.

3.2.13.2 Every Service Facility will be provided with a burglar-alarm installation.

3.2.14 IS/RA point Specifications

3.2.14.1 As laid out in the General Service Description the IS/RA point is no part of the Collocation Service. If all the conditions as described in the General Service description are met, the IS/RA point will be installed as an optional non-standard facility in the CDF of Service Taker. In some cases the IS/RA point can be installed in the Physical Collocation Space.

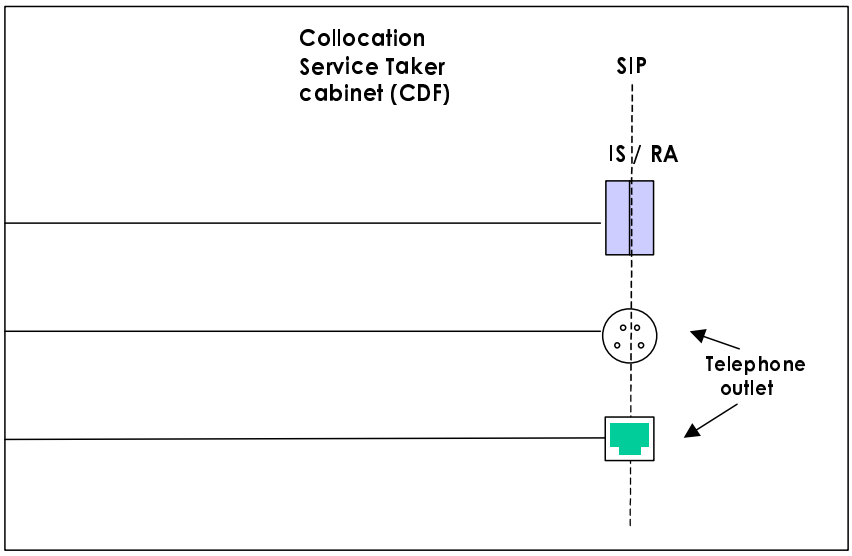

Figure 1: Service Interface Point (SIP) in the CDF of Service Taker

3.2.14.2 In cases where no IS/RA connection box is installed at the end user's network termination, the first telephone socket of KPN on which the Infrastructure Access Cable is fitted, is deemed to be the IS/RA point as per Figure above.

3.2.14.3 The telephone socket may be either:

i. A KPN 4-terminal telephone socket in compliance with ETS 300 001, section 8.2, Note 8.2 (NL) 1 or;

ii. a miniature 6-position plug/ socket (RJ 11/ 12 modular jack).

3.2.14.4 In cases where neither an IS/ RA nor telephone socket is fitted, Service Taker should call KPN Fault Contact Point to request clarification.

3.3 Service Taker Equipment

3.3.1 The standards dimensions as defined in ETS 300 119 are to be used for the construction of the cabinets for the Service Taker Equipment. The maximum available height for cabinets will be provided in the Site Report.

3.3.2 The Service Taker Equipment to be installed by Service Taker in the Collocation Space must conform with ETS 300 253 and ITU-T recommendation K27 together with the earthing facility to be supplied by KPN.

3.3.3 Service Taker Equipment may not produce or show signs of producing:

i. moisture;

ii. chemical compounds;

iii. mechanical substances;

iv. biological matter.

3.3.4 Service Taker-provided 230V AC/ 48V DC equipment and installation shall comply with NEN1010.

3.3.5 The presence of batteries in any form in the Collocation Space is not allowed.

3.3.6 The presence and/ or production of radio-toxic substances and chemical compounds (including PCBs and poisonous compounds) by Service Taker Equipment must comply with SI-212219010.

3.3.7 Electro-magnetic effects and (radioactive) radiation by Service Taker Equipment must comply with the requirements of ETS 300 386-1 Table 3.

3.3.8 Service Taker Equipment must comply with specifications for negative feedback, controlled fault and phenomena of switching on and off, as laid down in:

i. ETS 300 132-2 for 48VDC equipment (i.e. equipment that is supplied by 48VDC) to be ascertained at the coupling point, interface A;

ii. EN 55022;

iii. EN 60555: harmonic faults;

3.3.9 Negative feedback means a fault that occurs in Service Taker Equipment that sends negative feedback to the isolation point and/or coupling point for energy supply.

3.3.10 The maximum allowed heat dissipation of Service Taker Equipment in a Collocation Space is 300 W per m^2.

3.3.11 Service Taker will disperse the generated heat inside the Service Taker Equipment cabinets into the Collocation Space or, if possible, outside of the KPN Service Facility in accordance with the KPN rules and regulations on this matter.

3.3.12 The maximum noise production of Service Taker Equipment is 65 dB(A).

4 Facilities Link

4.1 Fibre Facilities Link

4.1.1 The optical fibre cable used for the Fibre Facilities Link shall comprise as a single section of single mode optical fibre cable in compliance with ETSI 300227 (ITU-T specification G.652).

4.1.2 The outside diameter of the Fibre Facilities Link will be in the range 15 mm to 22 mm.

4.1.3 The optical fibre cable shall contain zero halogen and be flame-retardant.

4.1.4 The cable used for the Fibre Facilities Link shall not allow the longitudinal transmission of water. This can be verified by testing the cable in accordance with EN 187 000 Method 605-B.

4.1.5 Any water blocking compounds incorporated in the cable used for the Fibre Facilities Link shall not have an adverse effect on any other components within the cable. The compounds shall not effect jointing and splicing operations, they shall not drip or flow from the cable over the temperature range -10°C to +40°C. The compounds shall not interact with other cable components in such a way to cause unacceptable changes in attenuation.

4.1.6 The cable used for the Fibre Facilities Link shall be able to withstand a tensile load of 2500N without damage to any of its component parts. At such a load the strain imparted to the fibres shall be $\leq$0.25% This can be verified by testing the cable in accordance with EN 187 000 Method 501.

4.1.7 The cable crush resistance and bend performance used for the Fibre Facilities Link shall be in accordance with the following table. The crush resistance can be verified by testing the cable in accordance with EN 187 000 Method 504. The cable bend performance can be verified by testing the cable in accordance EN 187 000 Method 513 - Procedure 1.

Crush Resistance	For an applied load = 15 kN/m with an indentation of ≤ 2,0 mm	Increase in fibre attenuation @1550 nm ≤0,05 dB
Cable Bend Performance	For a dynamic load 100 cycles 20 x cable diameter For Static Bend =10 x cable diameter	Increase in fibre attenuation @1550 nm ≤0,05 dB

4.2 Fibre ducts

4.2.1 Duct tubes (HDPE) will be of 40 mm diameter and corrugated internally to facilitate fibre blowing.

4.3 Copper Facilities Link

4.3.1 The number of wire-pairs per copper cable used as a Copper Facilities Link will be 100.

4.3.2 The diameter of a wire inside a copper cable shall be in the range 0,4 - 0,8 mm.

4.3.3 The copper cable must be suitable for outside plant applications.

4.3.4 The outer diameter of the copper cable will be between 26 and 29 mm.

4.3.5 The copper cable shall not allow the longitudinal transmission of water. This can be verified by testing the cable in accordance with EN 187 000 Method 605-B.

4.3.6 Any water blocking compounds incorporated in the cable shall not have an adverse effect on any other components within the cable. The compounds shall not effect jointing and splicing operations. The compounds shall not interact with other cable components in such a way to cause unacceptable changes in attenuation.

4.3.7 The copper cable used for the Copper Facilities Link shall be able to withstand a tensile load of 5000N without damage to any of its component parts.

5 TIE Cable

5.1 Tie Cable Specifications

Tie Cables will be in compliance with the specifications as follows:

Specification (at 1 MHz over 1 km)	Parameter
Number of wire-pairs per cable	100
Wire diameter	0,5 mm
NEXT loss	> 60 dB
Power Sum of all NEXT losses	> 50 dB
EL-FEXT Loss	> 55 B
Power Sum of all EL-FEXT losses	> 45 dB
Attenuation	≤ 20 dB
Impedance (nominal)	140 Ohm ± 5%

6 References

ETS 300 019-1-0	Environmental conditions and environmental tests for telecommunications equipment
ETS 300 019-1-3	Environmental conditions and environmental tests for telecommunications equipment
ETS 300 119	European telecommunication standard for equipment practice, parts 1 to 4 inclusive
ETS 300 132-2	Power supply interface at the input to telecommunications equipment; Part 2: operated by direct current (dc)
ETS 300 253	Earthing and bonding of telecommunications equipment in telecommunications centres
ETS 300 386-1	Public telecommunication network equipment; Electro Magnetic Compatibility (EMC) requirements. Part 1: Product family overview, compliance criteria and test levels
EN 55022	Limits and methods of measurement of radio interference characteristics of information technology equipment
ICNIRP	International Commission on Non-Ionizing Radiation Protection
NEN 1010	Safety stipulations for low-voltage installations.
NEN 3140	Low-voltage installations; provisions for carrying out work, inspection and maintenance safely
SI-212219010	General safety and environmental requirements for equipment and materials, issue 5, dated 931229; published by KPN. See Appendix I.

APPENDIX I

GENERAL SAFETY AND ENVIRONMENTAL REQUIREMENTS FOR EQUI MENT AND MATERIALS

SI-212219010

Approved by	:	mngr PCS TRS
Date of first issue	:	August 1988
Previous number	:	SI-260100901

Key words: - Safety
- Environment

APPENDIX I

PREFACE

This specification lays down the safety and environmental requirements with which equipment to be used in the PTT Telecom infrastructure must comply. Its purpose is to provide optimum protection of persons and to guard against dangers of any type whatsoever (including environmental pollution) which may occur during use of said equipment, use being interpreted in the widest sense (installation, utilisation, maintenance, removal, scrapping, etc.), and also to comply with the environmental legislation and show respect for the environment. Included in this specification are the labour and environmental legislation insofar as they are applicable. The labour aspects cover safety, health and well-being.

Public policy will as far as possible be followed and implemented.

CONTENTS

1 INTRODUCTION

In drawing up safety and environmental requirements, use is made of the current knowledge relating to safety and the environment and of standards in the field of safety and the environment. Since standards, knowledge and materials evolve, situations and circumstances may arise in the future which are not envisaged in current standards and requirements. The manufacturer is expected to impose requirements on his product which are such as to continue to ensure optimum safety and environmental protection, even if this is not specified in acts, standards or other regulations.

The supplier/manufacturer shall likewise satisfy himself that, in the event of a change in the legislation, the product is modified in consultation with PTT Telecom so as to continue to comply with the legislation.

In the production or import of products, substances and preparations by or on behalf of PTT Telecom, the registration regulations on environmentally dangerous substances shall be complied with.

The supplier is furthermore required to submit and carry out a sound replacement and removal procedure for products and equipment (or components thereof) which have been supplied to PTT Telecom by the supplier and which contain substances which are not (no longer) permitted for reasons of health or environmental risk. If the termination of the permission for "reasons of health or environmental risk" is based on rules laid down by PTT Telecom itself, the latter may again request a sound replacement and removal procedure from the supplier. Sound implementation of this procedure by or on behalf of PTT Telecom has no effect on any guarantee procedure.

1.1 Management of safety and environmental requirements

1) In a PTT Telecom product specification, more stringent requirements than those formulated here may be encountered for certain aspects. During the (type) verification, approval shall obviously be carried out on the basis of those more stringent requirements.

2) What the environmental implications are (may be) during installation, utilisation and removal (scrapping) shall be specified. The way in which the product has to be scrapped and which parts are subject to separate waste processing and/or reuse and what procedure is to be adopted shall furthermore be specified.

The aim shall be to enable all the substances to be reused (after separation). Thermal processing and dumping shall be avoided. If reprocessing is not feasible, thermal processing shall generally be preferred to dumping. All this shall be in accordance with the state of the art, the European and National Regulations and good management practices.

3) Safety and environmental requirements are classified on the basis of physical and chemical requirements; separate chapters therefore apply to the various properties.

1.2 Exemption

After consultation between PTT Telecom and the supplier, exemption may be granted on one or more parts of this specification. This shall be recorded in writing. With regard to environmental aspects, deviations shall be reported in writing to the Logistics Manager of PTT Telecom. An exemption which has been granted shall be of a temporary nature and/or application-based. No exemption can be granted in relation to the legally stipulated regulations.

1.3

For applications of components or structures in which damage or injury may arise as a consequence of generally safe handling, a warning in this connection shall be placed in a logical position in or on the system (part).

2 STRUCTURE OF THE DOCUMENT

The structure of this general specification can roughly be divided into three parts: the points of a general nature are contained in Sections 1 to 6 inclusive and in Section 11, the safety requirements in Sections 7, 9 and 10 and the environmental requirements in Sections 8 and 12.

3 FIELD OF APPLICATION

This specification applies to all operational equipment which is part of, or will be part of, the PTT Telecom infrastructure and to the terminal equipment and consumer products to be marketed by PTT Telecom B.V.

Safety requirements relate to the "man-machine relationship" in which the environment also plays a part.

Dangers, environmentally harmful and radioactive substances are also dealt with.

4 REFERENCES

4.1 General

Preferably the equipment shall comply with the NEN standards but this is not always possible as a result of purchase on the international market. In the cases then encountered, the international standards and requirements shall be adopted.

Unless otherwise specified, when reference is made to other documents in this specification of requirements, the most recent issue of those documents is meant. The documents to which reference is made are deemed to form part of the specification which makes the reference insofar as said documents are not in conflict with the further content of said specification. In the event of conflict, this specification shall take precedence (except in the case of legislation).

4.2 Acts, decrees and other official regulations

The acts, decrees etc. listed here are mentioned as examples and completeness is not guaranteed. Legislation and regulation are subject to changes. The publication references relate to the versions first published. There may be amendments and/or additions.

4.2.

Working Conditions Act (Netherlands Bulletin of Acts, Orders and Decrees 1980, 664).

Electricity Act (Netherlands Bulletin 1938, 523).

Nuclear Energy Act (Netherlands Bulletin 1962, 82).

Safety Act (Netherlands Bulletin 1934, 352).

Commodities Act (Netherlands Bulletin 1935, 793).

Chemical Substances Act (Netherlands Bulletin 1985, 639).

Ordinance of the Council relating to ozone-depleting substances (EEC/594/91).

4.2.2 Decrees

Asbestos decree as issued in accordance with the Working Conditions Act (Netherlands Bulletin 1988, 560).

Asbestos decree as issued in accordance with the Commodities Act (Netherlands Bulletin 1983, 418).

Asbestos removal decree (Netherlands Bulletin 1993, 290).

Decree on marking dangerous waste substances (BAGA) (Netherlands Bulletin 1993, 617).

Ozone-depleting substances regulation (Netherlands Bulletin 1992, 599).

Decree on regulating the notification of radioactive substances (Government Gazette 1987, 176).

Decree on regulating the indication of smoke detectors as issued in accordance with the Nuclear Energy Act (frequently changed).

Decree on specific harmful substances (Netherlands Bulletin 1991, 453).

Decree on radiation protection as issued in accordance with the Nuclear Energy Act (Netherlands Bulletin 1986, 465).

Decree on laying down rules in the matter of batteries and storage batteries containing mercury, cadmium or lead ("Battery Decree") (Netherlands Bulletin 1992, 486).

Decree on packaging and marking chemical substances (Netherlands Bulletin 1987, 516).

Cadmium decree (Government Gazette 1990, 538).

Electricity decree (Netherlands Bulletin 1953, 215).

DBB decree as issued in accordance with the Chemical Substances Act (Netherlands Bulletin 1988, 443).

The Ugilec 121, Ugilec 141 and DBBT decree relating to the Chemical Substances Act (Netherlands Bulletin 1989, 560).

PCB/PCT and chloroethane decree as issued in accordance with the Chemical Substances Act (Netherlands Bulletin 1991, 232).

Residual Categories Safety Decree (VBR) (Netherlands Bulletin 1990, 491).

Safety Plants and Workshops Decree (VBF) (Netherlands Bulletin 1938, 872).

Decree on safety information sheets as issued in accordance with the Chemical Substances Act (Netherlands Bulletin 1993, 252).

Decree on toys under the Commodities Act (Netherlands Bulletin 1991, 269).

4.2.3 Other official regulations

Decree on radiotoxicity classification regulation 1986 (Government Gazette 1987, 60).

Decree on substances requiring special attention as issued in accordance with the Chemical Substances Act (changes frequently).

Chlorofluorohydrocarbons and Halons regulation as issued in accordance with the Chemical Substances Act (Government Gazette 1990, 130).

Ozone-depleting substances regulation (Government Gazette 1991, 123).

Provincial ordinance on industrial waste substances (VBA).

Regulation containing detailed rules on packaging and marking chemical substances (Government Gazette 1988, 30).

Regulation containing detailed rules in the matter of marking batteries and storage batteries containing mercury, cadmium and lead (Government Gazette 1993, 223).

4.3 Guidelines

Guidelines on electrical engineering materials (No. L77/29: 73/23/EEC).

Press report 87/163 of the Ministry of Social Affairs and Employment.

Guideline on radio-frequency radiation for transmitting devices.

(Publication 90-01, Ministry of Housing, Town and Country Planning and Environmental Hygiene).

4.4 International standards

[1] Title: "Safety requirements for mains operated electronic and related apparatus for household and similar general use."
IEC 65

[2] Title: "Octave, half octave and third-octave bandfilters intended for the analysis of sounds and vibrations."
IEC 225

[3] Title: "Sound level meters."
IEC 651

[4] Title: "Integrating-averaging sound level meters."

IEC 804

[5] Title: "Safety of laser products - Part 1: Equipment classification, requirements, and user guide."
IEC 825-1

[6] Title: "Safety of laser products - Part 2: Safety of optical fibre communication systems."
IEC 825-2

[7] Title: "Acoustics - Normal equal-loudness level contours."
ISO 226

[8] Title: "Acoustics - Preferred reference quantities for acoustic levels."
ISO 1683

[9] Title: "Evaluation of human exposure to whole-body vibration."
ISO 2631

[10] Title: "Acoustics - Determination of sound power levels of noise sources - Precision methods for broad-band sources in reverberation rooms."
ISO 3741

[11] Title: "Acoustics - Determination of sound power levels of noise sources - Precision methods for anechoic and semi-anechoic rooms."
ISO 3745

[12] Title: "Safety colours and safety signs."
ISO 3864

[13] Title: "Personal eye protectors - Ultraviolet filters."
ISO 4851

[14] Title: "Personal eye protectors - Infrared filters."
ISO 4852

[15] Title: "Mechanical vibration - Guidelines for the measurement and assessment of human exposure to hand-transmitted vibration."
ISO 5349

[16] Title: "Human response vibration measuring instrumentation."
ISO 8041

4.5 European standards

[17] Title: "Safety of information technology equipment including electrical business equipment."
EN 60950 (IEC 950)

[18] Title: "Particular safety requirements for equipment to be connected to telecommunication networks."
EN 41003

4.6 Dutch standards

Along with the international standards which are closest to the Dutch standard.

[19] Title: "Safety stipulations for low-voltage installations."
NEN 1010
Title: "Electrical installations of buildings."
(IEC 364)

[20] Title: "Safety colours and signs"
NEN 3011
Title: "Safety colours and safety signs."
(ISO 3864)

[21] Title: "Indicating and registering electrical measuring instruments and accessories."
NEN 3523
Title: "Safety requirements for indicating and recording electrical measuring instruments and their accessories."
(IEC 414)

[22] Title: "Electronic mains-operated equipment for domestic use and similar general use."
NEN 3544
Title: "Safety requirements for mains-operated electronic and related apparatus for household and similar use."
(IEC 65)

[23] Title: "Radio transmitting equipment, safety requirements."
NEN 3548
Title: "Safety requirements for radio transmitting equipment."
(IEC 215)

4.7 PTT Telecom standards

[24] Title: "General requirements for earthing telecommunication system blocks in PTT Telecom buildings."
SI-260100751

[25] Title: "Packaging specification."
SV 001

4.8 Foreign standards

[26] Title: "Tests for flammability of plastic materials."
UL 94

[27] Title: "Danger due to electromagnetic fields."
VDE 0848

4.9 Works of reference

Title: National MAC list

Title: Factory Inspection 1992;
Publication P 145

5 DEFINITIONS

5.1 PTT Telecom telecommunication-infrastructure installations

This is a system of electrical, electronic and optical materials and mechanical structures whose purpose is to achieve the signal connections falling within the responsibility of PTT Telecom.

5.2 Accessibility

Accessible with difficulty: only accessible with the aid of tools. This is also understood as meaning a removable key.

Readily accessible: accessible with the aid of, for example, a hinge structure, knurled pins or a door (without key) and without using tools.

6 SYMBOLS AND ABBREVIATIONS

Arbo	:	Working conditions
BAGA	:	Decree on dangerous waste substances
CFC	:	Chlorofluorohydrocarbons
dB	:	decibel
DBB	:	Di-u-oxo-di-n-butylstanniohydroxyborane
DBBT	:	Dibromobenzyltoluene
EEC	:	European Economic Community
EC	:	European Community
EN	:	European Standard
Hz	:	hertz
IEC	:	International Electrotechnical Commission
ILO	:	International Labour Organisation
IR	:	infrared
ISO	:	International Standardisation Organisation
kHz	:	kilohertz
MAC	:	Maximum Acceptable Concentration
MHz	:	megahertz
nCi	:	nanocurie
NEN	:	Dutch Standard
NWB	:	National Networks
NWO	:	Network Operations
PAK	:	Polyaromatic hydrocarbons
PBB	:	Bromine-containing biphenylene
PCB	:	Polychlorobiphenyl
PBDO	:	Bromine-containing diphenyloxides
PCP	:	Pentachlorophenol
PCPL	:	Pentachlorophenyl laurate
PCS	:	Project Management Consultancy and System Engineering
PCT	:	Polychloroterphenyl
PVC	:	Polyvinylchloride
PVDC	:	Polyvinylidenechloride
Stb	:	Netherlands Bulletin of Acts, Orders and Decrees
Stcrt	:	Government Gazette
TRS	:	Transport Services
UL	:	Underwriters Laboratory
UV	:	ultraviolet
VBA	:	Provincial Ordinance on Industrial Waste Substances

VBF : Decree on Safety Plants and Workshops
VBR : Residual Categories Safety Decree
VDE : Verein Deutscher Elektrotechniker
VROM : Housing, Town and Country Planning and Environment

7 SAFETY

7.1 Acoustic safety

7.1.1 Audible noise spectrum requirement for equipment

1) Structures, machines and equipment shall not exceed the noise level of 65 dB(A) in the frequency range from 20 Hz to 20 kHz as an independent unit [8].

2) Depending on the investigation site (measurement chamber or open space) the method of measurement shall comply with: ISO 3741 [10] or ISO 3745 [11] or ISO 226 [7].

3) If the manufacturer has not carried out measurements in accordance with these methods, he shall submit his method of measurement along with results to PTT Telecom for approval.

4) The measuring instruments shall comply with IEC 651 [3] type 1 or IEC 804 [4] type 1. The A filter shall comply with IEC 225 [2].

7.1.2 Ultrasonic and infrasonic noise requirement for equipment

1) Structures, machines and equipment shall not exceed the noise level of 70 dB measured linearly in the frequency ranges from 0 to 20 Hz and from 20 kHz to 50 kHz as an independent unit. This requirement applies regardless of the size of the load [8].

2) Depending on the investigation site (measurement chamber or open space), the method of measurement shall comply with ISO 3741 [10] or ISO 3745 [11] or ISO 226 [7].

3) If the manufacturer has not carried out measurements in accordance with these methods, he shall submit his method of measurement along with results to PTT Telecom for approval.

4) The measuring instruments shall comply with IEC 651 [3] type 1 or IEC 804 [4] type 1, measurement range up to 50 kHz.

7.2 Fire safety

7.2.1 General

1) The structures and materials chosen shall be fire-retarding or noncombustible.

2) An exception applies to outside cables which enter a building or premises and to a number of application-based matters to be agreed in more detail.

7.2.2 C

1) Constructions shall be designed in such a way that it is not possible to touch components which may injure humans or animals as a consequence of high operating temperature.

2) The touchable parts must not exceed the temperatures stated in EN 60950 [17], subclause 5.1.

3) Constructions shall shield components having a low ignition temperature from other components.

7.2.3 Electrical engineering products

These shall comply with EN 60950 [17] subclause 4.4 (resistance to fire).

7.2.4 Plastics

These shall comply with UL 94/ V0 or V1 [26] or with the test described in EN 60950 [17] subclause 4.4 unless otherwise agreed in connection with environmental aspects.

7.3 Electrical safety

7.3.1 General

If this specification is required in conjunction with specification SI-260100751 [24], said specification is applicable for the earthing provisions. When a Statement of Compliance is issued, no compliance need be stated in section 7.3.

The installations concerned and permanently connected loads shall comply with NEN 1010 [19]; the equipment concerned shall comply with EN 60950 [17] and EN 41003 [18].

7.3.2 Protective measures

7.3.2.1 Protection against the danger of electrical contact

1) See NEN 1010 [19], chapter 23 for definitions.

2) See NEN 1010 [19], chapter 41 and chapter 47, for measures providing protection against the danger of electrical contact. See EN 60950 [17], subclause 2.9, for the dielectric strength of equipment, the creepage path, and the clear and insulation spacing, see subclause 5.1 thereof for the thermal requirements and see subclause 5.3 thereof for the insulation voltage requirements.

7.3.2.2 Barriers

Barriers of the type specified in chapter 41 of NEN 1010 [19] shall be protected against unintentional release but may be capable of being removed without using a key or tool.

This protection shall be tested with the standard test finger specified in NEN 3544 [22] or EN 60950 [17].

7.3.2.3 Spacing

See NEN 1010 [19], chapter 41 § 4, for spacing.

7.3.3 Safety earthing provisions

For safety purposes, the following requirements shall be met:

Every rack and/or cabinet shall have a terminal for a 35 mm^2 external earth cable connected to the PTT Telecom earthing system. Every rack and/or cabinet shall be provided with an earth rail having a minimum cross section of 50 mm^2 and shall be connected to the earth terminal. All frame parts shall be metallically interconnected. Every supporting frame or unit shall at least be connected to the earth rail by a 6 mm^2 connection or measurements shall demonstrate that the earth connection is sound ($R < 0.1\ \Omega$). These measurements shall be submitted by the manufacturer.

7.3.3.1 Earthing

External metal parts shall be connected to earth and to the PTT Telecom earthing system by a protective conductor (earth contact resistance $R < 0.1\ \Omega$). The protective conductor shall be continuous within a piece of equipment.

7.3.3.2 Earth leakage protection

See the following chapters of NEN 1010 [19] for earth leakage protection:

Chapter 41 § 413.1.7 Chapter 46 § 462.9
Chapter 47 § 473 Chapter 51
Chapter 53

7.3.3.3 Wall sockets

If wall sockets have been mounted on or at a construction their edge earth contacts shall be connected to the PTT Telecom earthing system and to the protective conductor.

Such wall sockets shall have a marking which cannot be removed and which indicates that the earth is connected to the PTT Telecom earthing system.

7.3.4 Protection against overcurrent, overvoltage and low voltage

7.3.4.1 Overcurrent

See NEN 1010 [19], chapter 43, for protection against overcurrent.

7.3. . e o t e

See NEN 1010 [19], chapter 44, for protection against overvoltage. The use of surge arresters as a protection against overvoltage shall be avoided as far as possible in favour of other methods. If surge arresters are nevertheless used, this shall be communicated to PTT Telecom.

7.3.4.3 Low voltage

See NEN 1010 [19], chapter 45, for protection against low voltage.

7.3.5 Voltage and current supply disconnection

See NEN 1010 [19], chapter 46, for voltage and current supply disconnection.

7.3.6 Choice of equipment, conductors and accessories

7.3.6.1 General stipulations

Equipment, conductors and accessories which comply with the standards laid down by the Minister of Economic Affairs shall automatically be deemed to comply with the Electricity Regulation of 1976.

If the standards laid down by the Minister are not complied with, the manufacturer shall demonstrate that the materials do comply with the Electricity Regulation of 1976 or with the guidelines EEC 73/23 and pb. EC L77/1973.

7.3.6.2 S

These shall comply with the appropriate stipulations, standards or guidelines.

7.3.6.3 Conductors and accessories

The conductors and accessories shall be resistant to the mechanical, electrical, chemical and thermal conditions which may occur during use. See EN 60950 [17], subclause 2.9, for the creepage path, and the clear and insulation spacing, see subclause 5.1 thereof for the thermal requirements and see subclause 5.3 thereof for the insulation voltage requirements.

7.3.6.4 tor e b tteries

Storage batteries having sealed cells shall be fitted with flame-retaining ventilation caps. See NEN 1010 [19], Art. 723, and the supplement to said article dated May 1992.

7.3.7 Equipment and machines

7.3.7.1 General

Equipment and/or machines which comply with the standards laid down by the Minister of Economic Affairs shall automatically be deemed to comply with the requirements of PTT Telecom. If the standards laid down by the Minister are not met, the manufacturer shall state the European or international standards, requirements or guidelines with which the product complies. The equipment and/or machines shall comply with the requirements of class I, II or III (as defined in NEN 1010 [19]).

7.3.7.2 Measuring instruments

If a measuring instrument is connected to the electrical mains, there shall be a DC isolation between the mains and the equipment to be measured. The measuring instrument shall comply with the requirements of NEN 3523 [21] and the electrical safety requirements mentioned above.

7.3.7.3 R

This shall comply with NEN 3548 [21] (IEC 215), the above mentioned safety requirements and the requirements imposed in chapter 13 with respect to electromagnetic safety.

7.4 Mechanical safety

7.4.1 Definitions

7.4.1.1 Controls

Controls are understood to be handles, switches, knobs, handwheels and the like whose purpose is to operate installations and equipment.

7.4.2 Protective measures

7.4.2.1 General

Constructions of any type whatsoever shall be designed in such a way that they present no danger of injury to the user and staff.

Constructions shall be designed in such a way that no danger arises for the user or staff under conditions of underloading or overloading.

Bolts or screws having counter-sunk heads shall be used for surfaces on which work is to be carried out. If thin sheet material is used, the sheet shall be recessed at the point or points where the screw head is situated so that the latter is level with, or lower than, the surface of the sheet.

7.4.2.2 Edges and corners

The corners and surfaces of equipment, tables, devices and other structures shall be machined so as to eliminate the danger of injury under normal conditions.

7.4.2.3 Protection against moving parts

Moving parts shall be shielded by means of cowling.

7. .2. D

Detachable parts, panels, plates and drawers shall be mounted so as to avoid overturning and detachment by vibration or impact.

7.4.2.5 Protection against contact with surfaces at elevated temperature

The protection shall comply with EN 60950 [17], subclause 5.1.

7.4.2.6 Controls

1) Controls shall be designed so that they cannot endanger the user and/or inflict injury on him.

2) Controls shall be recognisable as such.

3) The function(s) of the controls shall be clear. Said function(s) shall therefore be clearly and indelibly indicated for each control by means of a pictogram, symbol or wording.

4) The setting of the control shall be clear and unambiguous.

5) The controls shall be protected or made safe against unintentional operation if such operation has undesirable consequences.

6) The settings of controls must not be allowed to deviate from the original settings while in operation.

7) The controls shall be positioned so as to be in a logical position as envisaged by current ergonomic views and to result in a logical partitioning of functions.

7.4.2.7 Fragmentation (implosion and explosion)

1) Measures shall be taken to prevent injury which may be caused by the implosion of cathode ray tubes.

2) Cathode ray tubes shall comply with the requirements laid down in IEC 65 [1] or NEN 3544 [22].

3) Components (for example high-pressure lamps) which may fragment for any reason whatsoever shall be protected so that this does not present danger or inflict injury on persons in the vicinity.

7.4.2.8 Casing and shield requirements

1) Casings and shields shall be resistant to the mechanical, electrical, chemical and thermal conditions which may occur under the conditions of use.

2) The casings and shields shall be constructed so that, in the event of deformation, material flow or internal stress situations, no dangerous parts can be touched.

7.4.2.9 Protection against mechanical vibrations

1) Mechanical vibrations shall not exceed the values stated in ISO 2631/1 [9], ISO 2631/3 [9] and ISO 5349 [15].

2) The measuring instrument shall comply with ISO 8041 [16].

7.4.2.10 Structures

1) Under normal operational conditions, structures shall be so rigid that no dangerous situations can arise for persons. Structures shall conform with the rigidity test stated in NEN EN 60950 [17], subclause 4.1.

2) Structures shall be so designed that no electrical or mechanical defects can arise when equipment is sited or removed.

7.5 Optical safety

7.5.1 General

7.5.1.1 Measuring equipment

In the measuring equipment in use at PTT Telecom, semi-conductor lasers and LEDs are permitted whose peak and mean output power is such that they fall within Class 1 or Class 3A of IEC 825-1 [5].

7.5.1.2 Class 1 and Class 3A lig t sources

Class 1 light sources are safe under operational conditions which can reasonably be foreseen.

Exposure of the naked eye to Class 3A light sources is not dangerous. Direct observation of radiation from Class 3A light sources with optical aids (magnifying glasses, microscopes, etc.) can, however, be dangerous.

7.5.1.3 Optical fibre systems

The requirement imposed by PTT Telecom on optical fibre systems is that the peak and mean optical output power of the transmitters is such that the hazard level of such systems is 1 or 3A as specified in IEC 825-2 [6].

The mean optical output power of the transmitters measured 1 sec or more after the system has been broken (for example, as a result of a connector or cable being broken) shall therefore comply with the values specified in the tables below.

Maximum permissible mean optical output power for optical fibre systems of hazard class 1:

Wavelength range around Lambda (nm)	850	1300	1550
$Pmax_{mean}$ (mW), monomode fibre	N.A.	8.8	10
$Pmax_{mean}$ (mW), multimode fibre	0.4	8.9	N.A.

Maximum permissible mean optical output power for optical fibre systems of hazard class 3A:

Wavelength range around Lambda (nm)	850	1300	1550
$Pmax_{mean}$ (mW), monomode fibre	N.A.	29	50
$Pmax_{mean}$ (mW), multimode fibre	2	46	N.A.

7.5.1.4 Hazard levels of optical fibre systems

The hazard level of an optical fibre system is defined as the potential hazard at accessible points within an optical fibre system and is based on the level of optical radiation which can escape in circumstances which can reasonably be foreseen. The hazard levels correspond to the classification of light sources specified in IEC 825-1 [5].

7.5.1.5 Assessing the hazard level of optical fibre systems

The hazard level of an optical fibre system is assessed by measuring the optical power emitted by the optical transmitter as specified in IEC 825-2 [6] using the method specified in IEC 825-1 [5].

7.5.2 Protection of e es inst l ser nd LED r di tion

Glass fibre cables shall be recognisable as such. Optical connectors (equipment connectors, cable connectors) in systems having a hazard class higher than 1 shall be provided with a warning label of the type specified in IEC 825-1 [5]. Optical measuring equipment employing lasers or LEDs shall be provided with a warning label of the type specified in IEC 825-1 [6].

7.5.3 Protection of eyes against UV light

The protection of eyes against UV light shall comply with ISO 4851 [13].

7.5.4 Protection of eyes against IR light

The protection of eyes against IR light shall comply with ISO 4852 [14].

8 SAFETY AND ENVIRONMENTAL ASPECTS

8.1 Radiotoxic substances

1) Materials and/or products whose specific radioactivity at any point exceeds 100 becquerels/gram (2.7 nCi/g) shall in principle not be used.

   The supplier has a duty to notify PTT Telecom in advance if radiotoxic substances having a specific activity higher than stated in the above sentence is used, also in cases of repeat deliveries.

   Under these circumstances, the following shall be stated:
   - isotope and mass number;
   - intensity of the source;
   - physical constitution;
   - chemical compound;
   - function of the radiator.

2) If delivery of radioactive material cannot be avoided, steps shall be taken to ensure that no harmful radiation dose is received by those who are continuously present in the vicinity of said materials and/or products. The radiating material shall be embedded/encapsulated in such a way that it cannot be removed from the embedding or encapsulation other than by destruction. In the case of the worst conceivable fault (for example fire and the consequences thereof such as fire fighting, repair work etc.), the radioactive contamination which may occur shall also be low and of a type such that no impermissible internal or external contamination of persons can occur.

3) The equipment and components used shall comply with the Nuclear Energy Act, in particular the Radiation Protection Regulation issued in accordance with the Nuclear Energy Act. The regulation regulates, inter alia, the licensing requirement and lays down expertise requirements. In addition, the regulation contains stipulations relating to the disposal of materials. If applicable, delivery shall take place only to the licensed department, to the permitted site and at an agreed time.

4) A radioactivity sign which cannot be removed shall be mounted on any part which contains a component having a specific radioactivity exceeding that stated in 10.1 and the manual shall adequately describe the position in the equipment and the use of said products, including the handling of the radioactive constituent during maintenance (including storage), defects, accidents, removal and scrapping.

The supplier has a duty to notify PTT Telecom as soon as a replacement product which is not radioactive is available.

The supplier has a duty to submit and carry out a sound replacement and removal procedure for products and equipment - or components thereof - which he supplies to PTT Telecom and which contain substances which are no longer permitted by the EEC regulations or national regulations for reasons of health or environmental risk.

If the termination of the permission for "reasons of health or environmental risk" is based solely on rules laid down by PTT Telecom itself, PTT Telecom may also agree a sound replacement and removal procedure with the supplier. Reliable performance of this procedure by or on behalf of PTT Telecom shall not affect any guarantee procedure.

5) It is a requirement that the radioactive component can be removed easily and without hazard if the equipment is removed.

6) This regulation shall apply for the agreed service life.

8.2 Other controlled substances

8.2.1 General

In many products, substances and preparations are used[1)] which are subject to limitations. A ban may apply to the use of other substances and preparations. There may also be a registration requirement for substances and preparations which are environmentally dangerous, which are carcinogenic or which are suspected of promoting the development of cancer. Furthermore, expertise requirements and/or other requirements may be imposed on use (in the widest sense). These limitations, obligations and bans may be based on EEC regulations, national regulations or rules imposed by PTT Telecom itself. Since the environmental and labour legislation is subject to constant change, it shall be assessed from time to time.

The substances involved are (inter alia):

- those which are to be considered as dangerous waste substances (in accordance with the environmental regulations in force) when disposed of;

1) Use is understood to mean use in the widest sense. It therefore also includes storage, transportation, removal and scrapping.

N.B. a. The exception mentioned in the BAGA, the so-called Object Regulation, will not be applicable to PTT Telecom as a large user.[2)]

b. Further guidelines with respect to dangerous waste substances can be obtained from "PTT Telecom Logistiek".

- those substances referred to in the PCB, PCT and chlorethene decree issued in accordance with the Chemical Substances Act, the DBB decree issued in accordance with the Chemical Substances Act, the Ugilec 121, Ugilec 141 and DBBT decree issued in accordance with the Chemical Substances Act, the regulation on chlorofluorohydrocarbons and halons issued in accordance with the Chemical Substances Act, the decree on ozone-depleting substances, the regulation on ozone-depleting substances, the "Battery Decree", the Asbestos decree issued in accordance with the Working Conditions Act, the Asbestos Regulation of the Commodities Act, the Decree on Safety Plants and Workshops, the Residual Categories Safety Decree or the Specific Harmful Substances Decree under the Working Conditions Work Act;

- those which fall into the categories mentioned in Art. 34, paragraph 2 of the Chemical Substances Act;

- those which come under the Cadmium Decree relating to the Chemical Substances Act;

- those which are substances requiring special attention for the purpose of Art. 22 of the Chemical Substances Act;

- those which fall into one of the categories mentioned in Art. 2, paragraph 1 of the Dangerous Substances Act, or may be subject to the latter and/or additional regulations during delivery and during the service life of the products.

Without prejudice to what is stated elsewhere in the purchasing agreement, the supplier shall advise PTT Telecom in advance if one or more of the substances and preparations referred to have been used, in what and where. The supplier shall report when a replacement substance or preparation (which does not occur in the above mentioned category) is available for the purpose.

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2) This rule is in this case imposed by PTT Telecom itself.

8.2.2 Requirements relating to the use of toxic substances

1) PTT Telecom states that products and/or preparations in which the substances and preparations referred to in § 8.2.2.5 occur (such as, for example, PCBs) shall not be used unless expressly required by PTT Telecom and the use of the substances and preparations referred to is not subject to a ban (for that particular application).

2) If use is permitted, these substances shall be embedded in such a way in the equipment that they do not present any problem in normal use (including maintenance) of the product in the worst conceivable case. These, and possibly other substances as well, may, however, present problems if a fault occurs in the equipment or if the products enter the waste stage. A simple and safe procedure to be adopted in such a case shall be specified at the time of delivery.

3) The supplier has a duty to submit and carry out a reliable replacement and removal procedure for products and equipment - or components thereof - which have been delivered to PTT Telecom by the supplier and which contain substances which are not, or are no longer, permitted by the regulations of the EEC or by national regulations for reasons of health or environmental risk.

   If the termination of the permission for "reasons of health or environmental risk" is based exclusively on rules imposed by PTT Telecom itself, PTT Telecom may agree a reliable replacement and removal procedure with the supplier. A reliable performance of this procedure by or on behalf of PTT Telecom does not affect any guarantee procedure.

4) These regulations are applicable for the agreed service life.

5) Substances which shall not be incorporated in operational and control equipment to be used by PTT Telecom are, for example:
   - beryllium and beryllium compounds (including heat-conducting paste based on beryllium oxide);
   - toluene diisocyanate (2-methyl-1,4-phenylene diisocyanate);
   - formaldehyde;
   - asbestos and asbestos-containing products;
   - epichlorohydrine;
   - polycyclic aromatic hydrocarbons;
   - benzidine;
   - prohibited pesticides;
   - chlorinated paraffins;

- PCB;
- PCP;
- PCPL;
- CFCs and their equivalents causing the greenhouse effect and depleting the ozone layer;
- substances causing lasting corrosion.

6) Substances of which limited use may be made in consultation with PTT Telecom and subject to the prevailing legal requirements are:
   - PVC and PVDC, particularly in products with a long life (10 years or more);
   - mercury and mercury compounds;
   - adhesive joints between parts which have to be separated in the recycling process;
   - pigments based on heavy metals;
   - substances releasing harmful gases when burnt (for example chlorine).

8.2.3 Production of harmful substances and/or products

If products are delivered which produce harmful substances, for example gases, during normal use, the manufacturer shall inform PTT Telecom of this prior to delivery.

9 PROTECTION AGAINST ELECTROMAGNETIC FIELDS AND RADIATION/ (UNINTENTIONAL) X-RAY RADIATION

9.1 General

1) These specifications are applicable to the frequency range from 0 Hz to 3000 GHz for the hazards relating to electrical, magnetic and/or electromagnetic fields.

2) The hazards resulting from the action of the fields on the human body are dealt with in VDE 0848 [27] and the limit values in this connection are specified in that standard. For the frequency range below 2000 MHz, the values stated in the Guideline on Radio-frequency Radiation from Transmitting Devices are applicable.

3) The requirements which PTT Telecom imposes on equipment and on the measurements are identical to those in VDE 0848 [27] or the Guideline on Radio-frequency Radiation in Transmitting Devices. As far as possible, the equipment must be designed so that personnel do not have to wear any personal means of protection.

4) Equipment shall in no case (including faults) emit a dose of X-ray radiation which is such that personnel can receive a dose equivalent which is greater than $^1/_{10}$th of the dose equivalent which must not be exceeded according to the Regulation on Radiation Protection issued in accordance with the Nuclear Energy Act for nonprofessionally exposed persons and is also not more than $^1/_{100}$th of the last-mentioned dose equivalent per incident.

9.2 Supplier

The supplier is expected to make proposals for the protection of personnel who have to work in electromagnetic fields which are deemed more intense than permissible in accordance with VDE 0848 [27], the I.L.O. Encyclopaedia of Occupational Health and Safety, or the Guideline for Radio-frequency Radiation from Transmitting Devices.

10 SAFETY COLOURS, SIGNS AND TEXTS

10.1 Applications

1) Safety colours, signs and texts (S and R phrases) shall be used wherever they have a direct logical relationship to the purpose of use and also wherever the regulations and circumspection require it.

2) The safety colours and signs used shall comply with NEN 3011 [20] or ISO 3864 [12]. Where applicable, the stipulations in the "Regulation on Packaging and Marking of Chemical Substances" and the "Regulations Relating to More Detailed Rules on Packaging and Marking of Chemical Substances" shall be met.

   In addition, the markings used shall be such that PTT Telecom can comply with the requirements imposed in the Working Conditions Act and in the Commodities Act.

3) If substances and preparations are delivered, they shall be accompanied by a safety information sheet in accordance with the decree on Safety Information Sheets issued in accordance with the Chemical Substances Act. The sheets shall be made available in all cases without being requested.

11 PACKAGING

Only paper, cellophane, cardboard, polythene and polypropene are permitted. Combinations of plastic and cardboard, such as blister packages, are not permitted. The materials shall be provided with the recycling logo. Adhesive tape shall consist solely of polypropene and an adhesive layer. Its use is, however, less desirable because it presents problems in paper recycling. Furthermore, the packaging specification SV 001 [25] shall be complied with.

12 REQUIREMENTS RELATING TO REPROCESSING (See also § 11.2)

Efforts shall be made to ensure that casings consist of parts, if possible of the same colour, which can readily be separated from one another.

PTT requires those substances to be specified by the supplier which make recovery cost-effective for shortage reasons, such as platinum, gold, silver in pure form, palladium etc.

The inscriptions on batteries and storage batteries shall comply with the requirements imposed in the regulation issued by the Minister of Housing, Town and Country Planning and Environmental Hygiene dated 15-11-1993 (Government Gazette 1993, 223). The ability to remove batteries and storage batteries shall comply with the requirements imposed in the Battery Regulation (Netherlands Bulletin 1992, 486).

The plastics used shall be made known, among other things by a standardised, generally used marking on the material concerned.

The additives used in the plastics for the purpose of stabilisation, colouring or fire retardation shall not consist of the following substances or shall only consist of them up to the stated maximum content:

- compounds of cadmium, chromium, mercury, arsenic, beryllium or antimony and organotin compounds, PBB and PBDO to a maximum of 50 mg/kg for each dismantable part;
- compounds containing lead, chlorine or bromine, with the exception of PBB and PBDO to a maximum of 5 g/kg for each dismantlable part.

The maximum contents relate to the concentration of the stated chemical element present. For organotin compounds, PBB, PBDO, chlorine compounds and bromine compounds, the concentrations of the compounds as a whole are applicable.

Aluminium parts in and on a construction must be readily capable of being removed from it. If possible, components shall be avoided in which plastics and metal, steel or copper (alloys) are virtually inseparably combined shall be avoided. What is intended in the previous sentence does not apply to covering layers on steel which are provided with a view to corrosion. A covering layer on steel shall not contain cadmium, lead, chromium or mercury.

The metal used in the construction shall preferably be composed of steel or galvanised steel. - **End of Technical Manual** -