



## Regulation

### ON PRIORITY RATING, REDUNDANCY, POWER SUPPLY AND PHYSICAL PROTECTION OF COMMUNICATIONS NETWORKS AND SERVICES

Issued in Helsinki on 14 February 2008

The Finnish Communications Regulatory Authority (FICORA) has, under section 129 of the Communications Market Act of 23 May 2003 (393/2003) and section 19 of the Act on the Protection of Privacy in Electronic Communications of 16 June 2004 (516/2004), prescribed as follows:

#### Section 1

##### Scope of application

This Regulation applies to the priority rating of public communications networks and public authority networks and the communications services provided in these networks, redundancy and reserve routes, power supply and securing power supply, and physical protection. This Regulation does not apply to the temporary provision of communications networks or services, or temporary capacity, DVB-H network transmitters or radio operators whose licence specifies population coverage of less than 85%.

#### Section 2

##### Definitions

*Telephone service* in this Regulation means a communications service enabling a user to make and receive national and international calls and to use emergency services by means of a number or numbers specified in the national or international numbering plan.

*A communications network or service component* in this Regulation means a network element, device or information system of which the communications network or service is comprised of, or which it uses.

*Transmission system components* in this Regulation mean the communications network components that use transmission links to establish connections intended for the transmission of electronic messages. In this Regulation, transmission system components also include packet-switched network routers, switches and similar devices.

*Transmission links* in this Regulation mean optical fibres or metallic conductors used for data transfer, or they may be based on free propagation of electromagnetic waves. The physical structures of transmission links are various cables and the accompanying structures needed for installation, extension and switching, and masts and aerials required by radio transmission links.

*A very large geographic area* in this Regulation means an area of more than 60,000 square kilometres.

*A large geographic area* in this Regulation means an area of more than 20,000 square kilometres.

*N + 1 assurance* in this Regulation means assurance where the number of necessary devices is N, equipped with one standby device.

### Section 3 Priority rating

The communications network or service components are rated as priority 1-5 in descending order of priority based on their significance. The priority criteria are described in table 1, and they are explained in more detail in the text section below.

**Table 1: Priority rating**

Priority	Communications network or service component
1	<p>A component that affects communications services in a very large geographic area, or</p> <p>a component that affects</p> <ul style="list-style-type: none"> <li>• <math>\geq 200,000</math> users' access to telephone services, or</li> <li>• <math>\geq 200,000</math> users' access to broadband services, or</li> <li>• <math>\geq 500,000</math> users' access to e-mail services, or</li> <li>• <math>\geq 300,000</math> users' access to mass communications services, or</li> <li>• <math>\geq 500,000</math> users' access to other communications services.</li> </ul>
2	<p>A component that affects communications services in a large geographic area, or</p> <p>a component that affects</p> <ul style="list-style-type: none"> <li>• <math>\geq 50,000</math> users' access to telephone services, or</li> <li>• <math>\geq 50,000</math> users' access to broadband services, or</li> <li>• <math>\geq 200,000</math> users' access to e-mail services, or</li> <li>• <math>\geq 100,000</math> users' access to mass communications services, or</li> <li>• <math>\geq 200,000</math> users' access to other communications services.</li> </ul>
3	<p>A component that affects</p> <ul style="list-style-type: none"> <li>• <math>\geq 150</math> GSM network speech channels, or</li> <li>• <math>\geq 1,000</math> users' access to telephone services, or</li> <li>• <math>\geq 1,200</math> users' access to broadband services, or</li> <li>• <math>\geq 50,000</math> users' access to e-mail services, or</li> <li>• <math>\geq 50,000</math> users' access to mass communications services, or</li> <li>• <math>\geq 100,000</math> users' access to other communications services.</li> </ul>
4	<p>The main transmitter in a mass communications network, or</p> <p>a component that affects</p> <ul style="list-style-type: none"> <li>• <math>\geq 75</math> GSM network speech channels, or</li> <li>• <math>\geq 250</math> users' access to telephone services, or</li> <li>• <math>\geq 250</math> users' access to broadband services, or</li> <li>• <math>\geq 10,000</math> users' access to e-mail services, or</li> <li>• <math>\geq 50,000</math> users' access to other communications services.</li> </ul>
5	<ul style="list-style-type: none"> <li>• A mobile network base station for a basic coverage area, or</li> <li>• a fixed telephone network concentrator, or</li> <li>• a broadband network concentrator, or</li> <li>• a base station for a fixed wireless broadband network, or</li> <li>• a terrestrial television network sub-transmitter serving more than 50 households, or</li> <li>• a radio operations sub-transmitter, or</li> <li>• a component affecting telephone services in the public telephone network, or</li> <li>• a component that affects the e-mail services of more than 1,000 users.</li> </ul>

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Table 1 shall be applied in such a way that the priority rating of the communications network or service component is the highest possible priority, whose criteria in table 1 is fulfilled by the component.

The number of speech channels indicated in table 1 serves as the priority rating criterion for GSM network base stations, and the number of speech channels indicated in table 1 and the coverage area served by the control unit serve as the priority rating criteria for base station control units. Table 1 shall not be applied to UMTS network base stations or base station control units; instead, the priority rating for a UMTS network basic coverage base station is always 5, and the priority rating for a UMTS network base station control unit is always 3.

The priority rating for equipment facilities shall always be the same as the rating for the highest priority communications network or service component placed in the facilities.

Telecommunications operators must specify, document and maintain updated information on all priority-rated components in their own communications networks and services, and facilities housing such components.

## 4 §

**Redundancy and reserve route arrangements**

The redundancy of priority 1 and 2 communications networks or service components must be implemented so that the failure of any one component will not disturb the communications network or service, or have a significant impact on it. Telecommunications operators must primarily seek solutions that allow the automatic implementation of redundancy for priority 1 and 2 communications networks or service components.

If such automatic implementation is not feasible at a reasonable cost, the telecommunications operator must take other measures to ensure that the impact of the faulty component can be minimised. The telecommunications operator must plan, test and document the measures that will replace the automatic redundancy implementation, and draw up a plan and a schedule for the introduction of the automatic redundancy system. This documentation shall be submitted to the Finnish Communications Regulatory Authority.

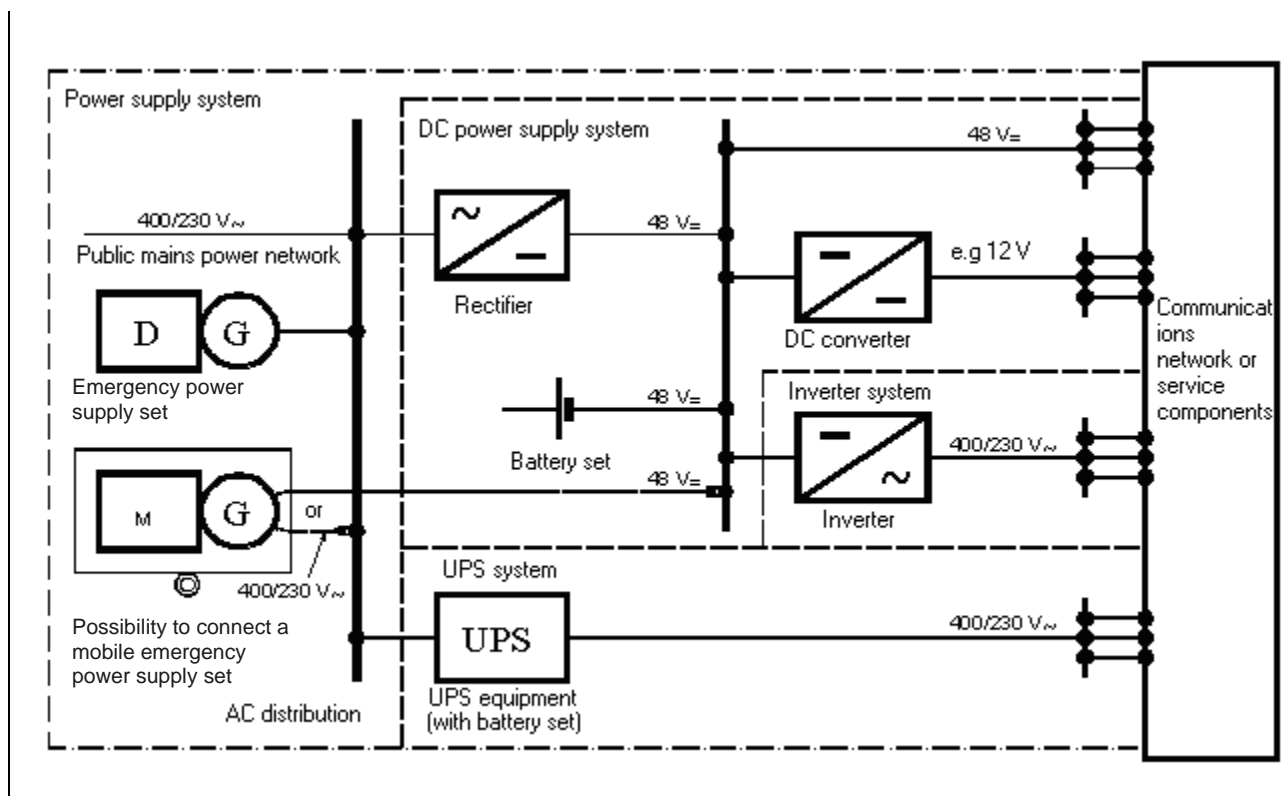
The redundancy implementation must be carried out in such a way that the priority 1 and 2 communications networks or service components which provide redundancy to each other are placed in equipment facilities located in different buildings. If the components cannot be placed in different buildings at a reasonable cost, the components must, where applicable, be placed in different fire chambers of the same building.

If priority 1 and 2 communications networks or service components that provide redundancy to each other are placed in the same building or in the same fire chamber, the reason for this must be stated in the telecommunications operator's documentation describing the priority rating.

Routes between priority 1 and 2 communications networks or service components must be provided with redundancy. These routes must be implemented so that the physical independence between the routes providing redundancy to each other is as large as possible.

## Section 5 Securing power supply

The power supply for a communications network or service component shall be secured against faults in power supply equipment and disturbances in the distribution of electrical energy from the public electricity network at least according to the requirements given in table 2 and elsewhere under this section. The power supply may also be secured according to the requirements of a higher priority rating instead of the component's own priority rating. The principle of a power unit consisting of power supply equipment and access to the public electricity network is illustrated in figure 1. Section 8 provides more detailed requirements for transmission system components.



**Figure 1: Power unit system**

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**Table 2: Securing the power supply**

Priority <sup>7)</sup>	Battery set <sup>1)</sup> back-up time	Emergency power supply set and other requirements
<b>1</b>	≥ 3 hours	A permanently mounted emergency power supply set secured by: <sup>2)</sup>  - Permanently mounted emergency power supply set N + 1 assurance or - at least 6-hour battery set back-up, or - a portable emergency power supply set dedicated for the equipment facility, with the necessary connections
<b>2</b>	≥ 6 hours <sup>3)</sup>	A permanently mounted emergency power supply set, or a portable emergency power supply set dedicated for the equipment facility, with the necessary connections
<b>3</b>	≥ 12 hours <sup>3), 4)</sup>	Access to a portable emergency power supply set if the use of an emergency power supply set is possible
<b>4</b>	≥ 6 hours <sup>3), 5)</sup>	Access to a portable emergency power supply set if the use of an emergency power supply set is possible
<b>5</b>	≥ 3 hours <sup>6)</sup>	Access to a portable emergency power supply set if the use of an emergency power supply set is possible

- 1) No battery set is required for the transmitters of a terrestrial mass communications network if the power supply for the transmitter is secured with a permanently mounted emergency power supply set.
- 2) Emergency power supply set back-up is not required for terrestrial mass communications network transmitters if the implementation involves unreasonable costs.
- 3) If a communications network or service component is linked to a power unit system in which the power supply is secured with a permanently mounted emergency power supply set, the minimum back-up time required of the battery set is 3 hours.
- 4) If the communications network or service component is located in a population centre, the minimum back-up time required of the battery set is 6 hours.
- 5) If at least three priority 4 communications networks or service components located outside a population centre use the same public electricity network access points and the power supply for the components is not secured with a permanently mounted emergency power supply set, the minimum back-up time of the battery should be extended to 12 hours.
- 6) If the equipment facilities cannot be reached within the 3-hour minimum back-up time required for the battery due to remote location, difficult terrain conditions or expected weather conditions, the minimum back-up time of the battery should be extended to 6 hours.
- 7) Priority refers to the priority rating specified for the communications network or service component under section 3.

If a telecommunications operator has a GSM network within the same coverage area as a UMTS network, the following exceptions can be made with regard to power supply back-up requirements specified in table 2 for UMTS base stations:

- The minimum back-up time for the battery set is 15 minutes.
- No emergency power supply set or access point for emergency power supply set is required.

The monitoring and alarm systems for power unit systems must be arranged so that the telecommunications operator will be informed of any failures or disruptions in the power unit system without delay.

If the equipment facilities of the same building house several priority 1 communications networks or service components, the components must be divided into appropriate functional entities, which are fed by separate power supplies. However, these entities may be fed by a shared public electricity network connection and emergency power supply sets.

The telecommunications operator must have written documentation on the power unit systems and the related power supply back-up systems. This documentation should indicate the methods of fulfilling the redundancy requirements of this Regulation, the location of the equipment, their technical features, and maintenance arrangements.

#### Battery sets:

The total capacity of a battery set shall be shared with at least two battery units if the required total capacity is over 1000 Ah, unless special reasons prevent this.

The battery set must be controlled for proper performance and sufficient capacity at least once a year. The sufficiency of the battery set's capacity should be checked every time new devices are linked to the power unit system, or if the power consumption of the existing devices linked to the system changes.

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If it is not possible to provide  $\geq 6$  hours battery set back-up for the power supply for a priority 4 communications network or service component at a reasonable cost due to the structure or characteristics of the equipment facility, the component in question should be secured with a  $\geq 3$  hour battery set back-up instead of  $\geq 6$  hours, plus access to a portable emergency power supply set, if the use of an emergency power supply set is possible. If this exception is applied, new communications networks or service components may not be added to the equipment facilities, or the capacity of the existing components may not be significantly increased.

Where priority 2, 3 and 4 communications networks or service components are concerned, the battery set must be dimensioned so that it can feed all of the equipment required for maintaining telecommunications operations.

However, a communications network or service component will not require battery set back-up if the component is placed in equipment facilities located in a customer's building and the component only serves that building.

Rectifiers:

Rectifiers shall be dimensioned so that the power needed for the load can be fed in parallel to the discharged battery set without a standby rectifier. The rectifier shall be able to recharge the battery set to 80% of its nominal capacity within 24 hours in parallel with the load. A standby rectifier can also be used for recharging.

Rectifiers must be assured with at least N+1 assurance. However, this is not required of a system for access networks, when the number of accesses is  $\leq 30$ .

Emergency power supply sets:

A permanently mounted emergency power supply set shall start automatically in case of a break in power supply from the public electricity network. It shall be able to operate unmanned for at least 12 hours and its fuel and fuel tank shall be dimensioned for at least one week's use. If there are justified grounds that prevent the dimensioning of the amount of fuel and

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fuel tank of the permanently mounted emergency power supply set for a week's use, the telecommunications operator must make other arrangements to ensure the fuel supply of a permanently mounted emergency power supply set for at least a week.

A telecommunications operator shall have at its disposal a sufficient number of properly working portable emergency power supply sets and sufficient personnel to use and move them. A priority 2 communications network or service component shall always have an emergency power supply set at its disposal, or other arrangements must be made to ensure uninterrupted power supply; the telecommunications operator must ensure that the emergency power supply set is operable for the duration needed.

The telecommunications operator shall draw up and maintain a written plan explaining how it prepares for public electricity network failures with portable emergency power supply sets. The plan should indicate at least the following things regarding portable emergency power supply sets: sufficient number of emergency power supply sets and power supply capacity, geographic storage, servicing and maintenance during storage, delivery to places of use, and ensuring operation at the place of use.

An emergency power supply set must be dimensioned so that it can feed all of the equipment required for maintaining telecommunications operations.

UPS equipment:

Uninterruptible power supply (UPS) systems for alternating current may be used to ensure the power supply for communications networks or service components. In terms of battery set back-up time and N+1 assurance for equipment, the same requirements apply to the UPS equipment as to other power supply equipment if the UPS equipment is used as the only power supply device or the only power supply battery set back-up for the communications network or service component.

## Section 6

### **Power supply for telecommunications terminal equipment**

Telephone traffic in the basic access of a public switched telephone network shall be ensured with one terminal also during a break in electricity.

Power supply from an exchange or a concentrator in order to guarantee operations during a break in electricity is not obligatory, if a repeater is needed for an ISDN subscriber line or if a telephone service is based on IP technology.

A telecommunications operator offering such ISDN access or telephone service shall in an explicit way inform its customers of possible limitations in the telephone service during electricity breaks.

## Section 7

### **Physical protection**

A telecommunications operator shall ensure that its equipment facilities intended for public telecommunications operations at least meet the requirements specified in tables 3, 4 and 5 and elsewhere in this section regarding physical protection.

By way of exception to the requirements on the structure of equipment facilities specified in table 4, a telecommunications operator may bring priority 1 communications networks or service components to equipment facilities the perimeters of which only meet priority 2 requirements.

The telecommunications operator must also ensure that the communications network or service components remaining outside the priority rating have been physically protected in such a way that they cannot be easily accessed by unauthorised persons.

Section 8 provides more detailed requirements for transmission system components.

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**Table 3: Access control to equipment facilities**

<b>Priority rating of the equipment facilities</b> <sup>1)</sup>	<b>Requirements</b>
<b>1</b>	<p>The facilities must be equipped with an access control system in which access rights can be specified for individual electronic opening devices, and in which each access is registered.</p> <p>The personnel and subcontractors shall be identified from a photo ID card or from an access permit and official ID. All visitors must be registered and their access shall be controlled.</p> <p>The facilities must be equipped with a recording surveillance camera system.</p> <p>The facilities must be equipped with an automatic security alarm system that reports any intrusion into the facilities from the outside.</p>
<b>2</b>	<p>The facilities must be equipped with an access control system in which access rights can be specified for individual electronic opening devices, and in which each access is registered.</p> <p>The personnel and subcontractors shall be identified from a photo ID card or from an access permit and official ID. All visitors must be registered and their access shall be controlled.</p>
<b>3</b>	<p>All doors to the facilities must be locked with a key-operated mechanic or electro-mechanic lock.</p> <p>The personnel and subcontractors shall be identified from a photo ID card or from an access permit and official ID. Visitors' access shall be controlled.</p>
<b>4 or 5</b>	<p>All doors to the facilities must be locked with a key-operated mechanic or electro-mechanic lock.</p> <p>Any cabinets or boxes that are accessible to unauthorised people without any instruments must be locked with a key-operated mechanic or electro-mechanic lock.</p>

1) Section 3 features the priority rating for equipment facilities.

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**Table 4: Structure of the equipment facilities**

<b>Priority rating of the equipment facilities <sup>1)</sup></b>	<b>Requirements</b>
<b>1</b>	<p>The equipment facility shall be situated below ground or its perimeter shall comply at least with the requirements for a reinforced concrete shelter of protection class K. The ceiling and surrounding walls of the underground facilities shall be of reinforced concrete or similar material and they shall hold in case the building falls down. All structural materials in the facilities must, as a rule, be non-flammable.</p> <p>The structure, installation and locking systems of the doors to the facilities shall hold against attempts to break-in with heavy tools.</p> <p>The equipment facilities shall not have any exterior windows.</p> <p>Prevention of water damage must be taken into account in the design and construction of the facilities. If the floor of the room is below the ground water level or if water damage otherwise may occur, the room shall be equipped with a leakage dewatering system which is not dependent on electricity supply from outside.</p>
<b>2</b>	<p>The ceiling, floors and perimeter walls of the equipment facility must be made of stone and constructed in such a way that the wall elements cannot be removed from the outside without breaking them. All structural materials in the facilities must, as a rule, be non-flammable.</p> <p>The structure, installation and locking systems of the doors to the facilities shall hold against attempts to break-in with conventional hand tools.</p> <p>Any exterior windows may not offer a view into the room. Windows and other openings must be physically protected. Buildings located outside population centres that are not permanently occupied may not have any exterior windows leading to the equipment facilities.</p> <p>Prevention of water damage must be taken into account in the design and construction of the facilities.</p>
<b>3</b>	<p>The ceiling, floors and walls of the equipment facility must be made of concrete, brick, heavy-duty wood, or other similar material, and constructed in such a way that the wall elements cannot be removed from the outside without breaking them.</p> <p>The structure, installation and locking systems of the doors to the facilities shall hold against attempts to break-in with conventional hand tools.</p> <p>The windows of equipment facilities must be physically protected when they are placed less than 4 metres above ground level. In addition, the windows of rooms providing access to the equipment facilities must be physically protected, if the windows are placed less than 4 metres above ground level. Buildings located outside population centres that are not permanently occupied may not have any exterior windows leading to the equipment facilities.</p> <p>Prevention of water damage must be taken into account in the design and construction of the facilities.</p>
<b>4 or 5</b>	<p>Access to the equipment facilities must be blocked from unauthorised people.</p> <p>The structure, installation and locking systems of the doors to the facilities shall hold against attempts to break-in without specific tools.</p> <p>Any cabinets or boxes that are accessible to unauthorised people without any instruments shall hold against attempts to break-in without specific tools.</p>

1)

Section 3 features the priority rating for equipment facilities.

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**Table 5: Alarms triggered by specific conditions**

Priority rating of the equipment facilities <sup>1)</sup>	Requirements
1 or 2	<p>The premises shall be equipped with an automatic fire alarm system, which will alert control personnel.</p> <p>If the temperature in the facilities falls below or rises above a set level, the control personnel shall be alerted.</p> <p>If the floor of the room is below the ground water level or if water damage otherwise may occur, the room shall be equipped with a humidity alarm system which will alert the control personnel if necessary.</p>
3 or 4	<p>If the temperature in the facilities falls below or rises above a set level, the control personnel shall be alerted</p>

1) Section 3 features the priority rating for equipment facilities.

## Section 8

### Securing power supply for transmission system components and their physical protection

If equipment facilities meeting the priority rating requirements are not available in the transmission system component's location area, the following exceptions may be applied to requirements specified in section 5 on securing power supply and section 7 on physical protection for such a component:

- Power supply requirements specified in section 5 for priority 3 communications networks or service components shall be applied to priority 1 or 2 transmission system components.
- Physical protection requirements specified in section 7 for priority 3 communications networks or service components shall be applied to priority 1 or 2 transmission system components.

## Section 9

**Physical protection of transmission links**

The physical protection of transmission links shall comply with the requirements referred to in table 6.

**Table 6: Physical protection of transmission links**

<b>Transmission link/equipment facilities</b>	<b>Requirements</b>
Connection points, cable terminations and cable joints	Any connection points, cable terminations or joints that are accessible to unauthorised people without any instruments shall be protected with boxes. The box shall hold against attempts to break-in without specific tools and have a mechanical or electro-mechanical locking system.
Manholes	Manholes providing access to equipment facilities must be locked. Manholes with connection points or equipment must be locked, or, alternatively, the connection points and equipment must be locked. The appearance of the manhole should not suggest it contains important connections.
Antenna masts	Antenna masts must, with regard to the surrounding environment, be physically protected against attempts to break-in, climbing and vandalism.
Cables	Any visible cables with easy access from outside the equipment facilities must be protected; however this does not apply to antenna mast cables.

## Section 10

### **Transitional provisions and entry into force**

This Regulation enters into force on 3 March 2008 and will remain in force until further notice.

This Regulation repeals FICORA's Regulation 30 D/2003 M of 6 June 2003 on power supply for a communications network, Regulation 48 B/2004 M of 20 October 2004 on the physical protection of a communications network, and Regulation 27 E/2005M of 1 April 2005 on the structure, access points, priority rating and redundancy of a communications network.

Telecommunications operators must specify and document the priority ratings for communications networks or service components and equipment facilities completed before this Regulation entered into force in accordance with this Regulation by 31 December 2008.

Communications networks or service components, equipment facilities and transmission links completed or under construction before this Regulation entered into force must meet the requirements of this Regulation by 31 December 2009. Until this time, said communications networks or service components, equipment facilities and transmission links must at least meet the requirements of FICORA's Regulations 27 E/2005 M, 30 D/2003 M and 48 B/2004 M.

By way of exception to the transitional provision of section 10, sub-section 4, regulations and guidelines regarding the structure of equipment facilities that were in force at the time of planning and building shall be applied to equipment facilities completed or under construction before this Regulation entered into force. If the communications network or service components placed in the equipment facilities completed before this Regulation entered into force are changed after its entry into force in such a way that the priority rating for the equipment facilities is higher than before, the facilities must also meet the requirements of this Regulation regarding the structure of equipment facilities.

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By way of exception to the transitional provision of section 10, sub-section 4, the redundancy routes between communications networks or service components that were completed or in construction when this Regulation entered into force and became priority 1 or 2 components based on this Regulation, must meet the requirements of this Regulation by 31 December 2010.

By way of exception to the transitional provision of section 10, sub-section 4, the battery set back-up for priority 3, 4 and 5 communications networks or service components must meet the requirements of this Regulation by 31 December 2010. Until this time, the battery set back-up for said communications networks or service components must at least meet the requirements of FICORA's Regulations 30 D/2003 M.

If a telecommunications operator applies the transitional provision of section 10, sub-section 4 or 7, it must store the information regarding the priority rating for the communications network or service component in question under FICORA's Regulation 27 E/2005 M, or the priority rating for equipment facilities under FICORA's Regulation 48 B/2004 M.

Section 11  
**Information and publication**

This Regulation is included in the Series of Regulations issued by the Finnish Communications Regulatory Authority and can be obtained from the Customer Service Office of FICORA:

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