

Issued: 17 June 2021	Enters into force: 1 July 2021	Validity: until further notice
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Legal basis:
Act on Electronic Communications Services (917/2014), section 244, subsection 1, paragraphs 1–3, 5, 6, 8 and 12–14, and section 247, subsection 4

Provisions on sanctions for operations violating this Regulation are laid down in:
Act on Electronic Communications Services (917/2014), sections 330–332 and 340

Implemented EU legislation:

Modification details:
Repeals FICORA Regulation 54 B/2014 M of 17 December 2014

Regulation on resilience of communications networks and services and of synchronisation of communications networks

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1 Scope of application

This Regulation applies to public telecommunications, i.e. public communications networks and services.

This Regulation's scope of application is defined so that the Regulation does not apply to:

- the temporary provision or capacity of public communications networks or services;
- an open WLAN network used for the provision of internet access services in the network coverage area in public outdoor or indoor facilities to a random set of users;
- private radio broadcasters.

This Regulation lays down provisions on:

- the priority rating of communications network and service elements in section 4;
- communications network hardware redundancy, reserve routes and the resilience of cooling systems in sections 5–7;
- power supply and the resilience of power supply in sections 8–16;
- physical protection in sections 17–18; and
- the synchronisations of communications networks in sections 19–22.

2 Objective of the Regulation

The objective of this Regulation is to safeguard the operation of public communications networks and services in disturbances and to set requirements for the synchronisation of public communications networks to ensure the quality of communications connections and services.

3 Definitions

Communications services

For the purposes of this Regulation:

- 1) *public telephone service* means a communications service referred to in section 3, subsection 1, paragraph 42 of the Act on Electronic Communications Services;
- 2) *short message service*, or SMS service, means a communications service provided in the mobile network that enables the sending and reception of short messages only containing alphanumeric characters and special characters;
- 3) *internet access service* means a communications service referred to in section 3, subsection 1, paragraph 3 of the Act on Electronic Communications Services;
- 4) *email service* means the submission, transfer or delivery service of electronic mail messages that uses internet name services in the transmission of messages;
- 5) *mass communications service* means the transfer or broadcasting of television or radio programmes and related ancillary and supplementary services in a mass communications network;
- 6) *other communications service* means a communications service referred to in section 3, subsection 1, paragraph 37 of the Act on Electronic

Communications Services that does not belong to any other service category defined in this section.

Definitions related to the structure of a communications network

For the purposes of this Regulation:

- 7) *communications network or service component* means a network element, device or information system which constitutes or is utilised by a communications network or service;
- 8) *transmission links* mean optical fibres and metallic conductors used for data transfer, or they may be based on the free propagation of electromagnetic waves. Physical structures of transmission links include various cables and the accompanying structures needed for installation, extension and switching, and the masts and aerials required by radio transmission links;
- 9) *transmission system components* mean the communications network components that use transmission links to establish connections intended for the transmission of electronic messages. For the purposes of this Regulation, transmission system components also include packet-switched network routers, switches and similar devices;
- 10) *access network* means the part of a public communications network which links internal communications networks in customers' buildings to the telecommunications operator's area or backbone network;
- 11) *coaxial cable-based cable television network* means a cable television network in which at least some of the access network transmission links are coaxial cables;
- 12) *optical fibre-based cable television network* means a cable television network in which transmission links are optical fibres;
- 13) *mobile network's basic coverage area base stations* mean base stations that enable the use of mobile communication services in a specific area. This definition does not include base stations that increase the mobile network's service capacity or base stations that improve quality and resolve coverage problems inside buildings;
- 14) *building base station* means a mobile network's basic coverage base station whose vital equipment facility is located in a building that is not meant for carrying out public telecommunications, and whose antenna is primarily located on the outer surface of the same building (wall or roof);
- 15) *emergency power supply unit* means equipment or a system used for guaranteeing the uninterrupted power supply of communications network or service components in the event of faults in power supply equipment or power cuts in the public electricity network;
- 16) *N+1 redundancy* means hardware redundancy where N stands for the number of necessary devices, equipped with one standby device;
- 17) *locality* means a concentration of inhabitants as defined by Statistics Finland.

4 Priority rating

Public communications network and service components are classified into priority ratings 1–5 in a descending order of priority based on the communications service type, the number of users and the size of the geographic coverage area in accordance with Table 1.

Table 1 shall be applied in such a way that the priority rating of a communications network or service component represents the *highest* level of priority that the component reaches according to the criteria in Table 1.

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

The priority rating of a transmission system component shall be determined on the basis of the number of users served by the component or the size of the coverage area. The priority rating shall be at minimum the same as the rating for the highest priority communications network or service component served by the transmission system.

The priority rating of a mobile network base station controller shall be no lower than 2.

The priority rating of a mobile network's basic coverage base station shall always be 5. Base stations other than basic coverage base stations do not need a priority rating.

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

The priority rating of a public communications network or service component and the related criteria are presented in Table 1.

Table 1. Priority rating

Priority rating	Communications network or service component
1	<p>A component that affects communications services in an area of more than 60,000 km², or</p> <p>a component that affects</p> <ul style="list-style-type: none"> • a public telephone service of ≥ 200,000 users, or • an SMS service of ≥ 200,000 users, or • an internet access service of ≥ 200,000 users, or • an email service of ≥ 500,000 users, or • a mass communications service of ≥ 300,000 users, or • other communications service of ≥ 600,000 users.
2	<p>A component that affects communications services in an area of more than 20,000 km², or</p> <p>a component that affects</p> <ul style="list-style-type: none"> • a public telephone service of ≥ 50,000 users, or • an SMS service of ≥ 50,000 users, or • an internet access service of ≥ 50,000 users, or • an email service of ≥ 200,000 users, or • a mass communications service of ≥ 100,000 users, or • other communications service of ≥ 300,000 users.
3	<p>A component that affects</p> <ul style="list-style-type: none"> • a public telephone service of ≥ 1,000 users, or • a public telephone service of ≥ 20,000 users, provided over an internet access service, or • an SMS service of ≥ 10,000 users, or • an internet access service of ≥ 1,200 users, or • an internet access service of ≥ 2,500 users, provided in a coaxial cable-based cable television network, or • an email service of ≥ 100,000 users, or • a mass communications service of ≥ 50,000 users, or • other communications service of ≥ 100,000 users.

4	<p>A component that affects</p> <ul style="list-style-type: none"> • a public telephone service of ≥ 250 users, or • a public telephone service of $\geq 10,000$ users, provided over an internet access service, or • an internet access service of ≥ 250 users, or • an internet access service of $\geq 1,500$ users, provided in a coaxial cable-based cable television network, or • an email service of $\geq 30,000$ users, or • a mass communications service of $\geq 20,000$ users, or • other communications service of $\geq 50,000$ users.
5	<ul style="list-style-type: none"> • A fixed telephone network concentrator, or • an access network component of a fixed network internet access service, serving more than 100 users, or • a base station of a fixed wireless internet access service, or • a terrestrial mass communications network component, serving more than 50 households, or • an optical fibre-based cable television network component, serving more than 50 households, or • a coaxial cable-based cable television network component, serving more than 4,000 households, or • a component that affects an email service of more than 5,000 users.

5 Hardware redundancy

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

If such an automatic implementation is not feasible at a reasonable cost, the telecommunications operator must take other measures to minimise the impact of the faulty component. Measures to replace an automated redundancy solution must be designed, tested and documented, and a plan and schedule must be prepared for the deployment of automated redundancy.

Priority 1 and 2 communications network or service components that provide redundancy for each other shall be placed in equipment facilities located in different buildings. If the components cannot be placed in different buildings at a reasonable cost, the components shall, where applicable, be placed at least in different fire compartments of the same building.

If communications network or service components with priority ratings 1 or 2 that provide redundancy for each other are placed in the same building and the same fire compartment, the reason for this shall be stated in the telecommunications operator's documentation describing the priority rating.

A telecommunications operator shall update and document the hardware redundancies of communications network and service components with priority ratings 1 or 2.

6 Reserve routes

Reserve routes shall be provided for priority 1 and 2 communications network or service components. These reserve routes shall be implemented so that the

physical independence between the routes providing redundancy for each other is as large as possible.

A telecommunications operator shall update and document the reserve routes of communications network and service components with priority ratings 1 or 2.

7 Resilience of cooling systems

The resilience of cooling systems for public communications network or service components with priority ratings 1 or 2 shall be implemented so that the failure of any structural part of the cooling system will not disturb the operation of the communications network or service. If the resilience of cooling systems for components with priority ratings 1 or 2 has been implemented by the redundancy or N+1 redundancy of the structural parts of the cooling systems, the operating condition of the structural parts shall be tested at least once a year and the testing results shall be documented.

If, by virtue of section 17, subsection 3 of this Regulation, the equipment facility of a transmission system component with a priority rating of 1 or 2 fulfils only the priority rating 3 requirements for the physical protection of equipment facilities, it is not obligatory to secure the cooling of such a transmission system component.

A telecommunications operator shall update and document the resilience of cooling systems of communications network and service components with priority ratings 1 and 2.

8 Securing power supply

The power supply of public communications network or service components shall be secured with an emergency power supply unit in the event of faults in the power supply equipment and power cuts in the public electricity network at least in accordance with the requirements presented in Table 2. In addition, the power supply shall be secured using emergency power stations in accordance with the requirements presented in Table 2.

The power supply may also be secured in accordance with the requirements of a higher priority rating instead of the component's own priority rating. The principle of a power supply system consisting of power supply equipment and access to the public electricity network is illustrated in Figure 1.

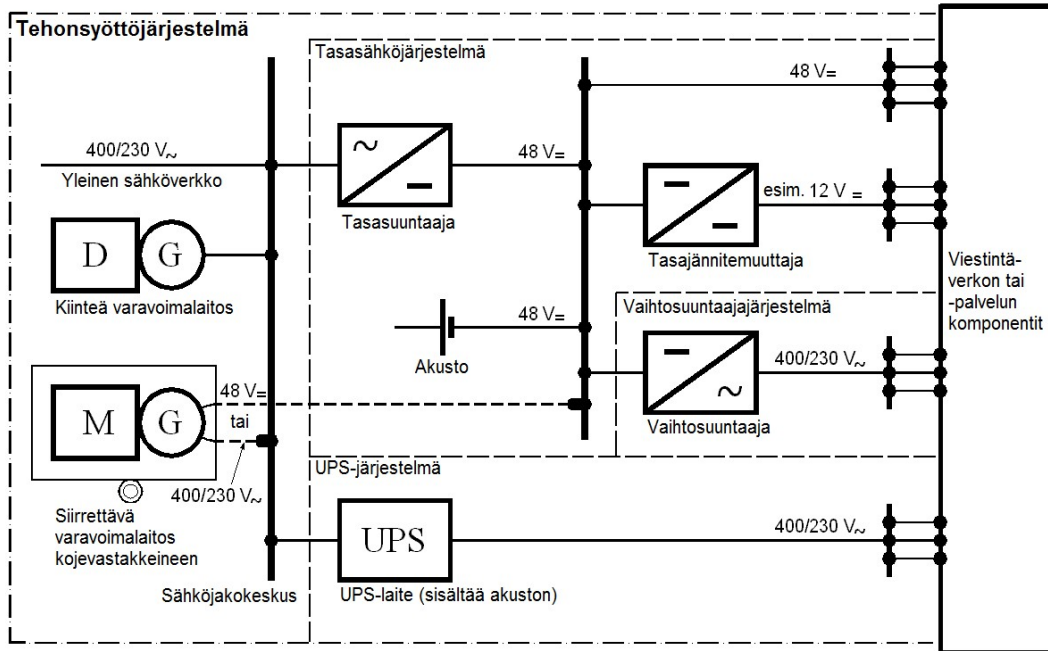


Figure 1. Principle of power supply system with accumulators and a UPS device as emergency power supply

Resilience requirements for the power supply of a public communications network or service component are presented in Table 2.

Table 2. Securing power supply

Priority rating ⁸⁾	Back-up time of emergency power supply unit ^{1), 2)}	Emergency power station and other requirements
1	≥ 3 hours ⁹⁾	A stationary emergency power station secured by: ^{3), 9)} <ul style="list-style-type: none"> - N+1 redundancy for the stationary emergency power station, or - extending the back-up time of the emergency power supply unit to at least 6 hours, or - an available mobile emergency power station with the necessary connections
2	≥ 6 hours ⁴⁾	A stationary emergency power station, or an available mobile emergency power station with the necessary connections
3	≥ 12 hours ^{4), 5)}	Possibility to connect a mobile emergency power station, if the use of an emergency power station is possible in the location
4	≥ 6 hours ⁴⁾	Possibility to connect a mobile emergency power station, if the use of an emergency power station is possible in the location
5	≥ 3 hours ^{6), 7), 10)}	Possibility to connect a mobile emergency power station, if the use of an emergency power station is possible in the location

- 1) No emergency power supply unit is required for transmitters in a terrestrial mass communications network if the power supply for the transmitter is secured with a stationary emergency power station.
- 2) No emergency power supply unit is required for a communications network or service component if the component is in an equipment facility located in a customer building and the component only serves the building in question.

- 3) A stationary emergency power station does not need to be secured for terrestrial mass communications network transmitters if the implementation involves unreasonable costs.
- 4) If a communications network or service component is linked to a power supply system in which the power supply is secured by a stationary emergency power station, the minimum back-up time required of the emergency power supply unit is three hours.
- 5) If a communications network or service component is located in a locality, the minimum back-up time required of the emergency power supply unit is six hours.
- 6) The back-up time of the emergency power supply unit for a mobile network's basic coverage area base station and the transmission system component serving it must be:
 - ≥ 4 hours for at least 30 per cent of the base stations located outside localities,
 - ≥ 2 hours, if the base station is a building base station located in a locality,
 - ≥ 15 minutes, if the base station is a 5G network base station.
- 7) If the equipment facility cannot be reached within the ≥ 2- to 4-hour minimum back-up time required for the emergency power supply unit due to its remote location, difficult terrain conditions or expected weather conditions, the minimum back-up time of the emergency power supply unit shall be extended to six hours.
- 8) "Priority rating" refers to the priority rating specified for the communications network or service component under section 3.
- 9) An exception applied to transmission systems, if required: if no equipment facility that meets the requirements set for the resilience of power supply with a priority rating of 1 is located in the proximity of the location of the transmission system component, the requirements set for the resilience of a power supply with priority rating 2 shall apply.
- 10) A telecommunications operator may shorten the back-up time required for the emergency power supply unit of a GSM or UMTS network's basic coverage area base station to ≥ 15 minutes while the back-up time required for the emergency power supply unit of an LTE network's basic coverage area base station shall be implemented in accordance with Table 2. The telecommunications operator shall, however, ensure that those technologies whose emergency power supply unit back-up time has not been reduced can maintain network coverage at least at its current level to secure the operation of telephone services and emergency services, in particular.

9 Planning and monitoring of power supply systems

The monitoring and alarm systems of power supply systems must be arranged so that the telecommunications operator will be immediately informed of any disruptions in power supply systems or the public electricity network.

If equipment facilities in a single building have several communications network or service components with a priority rating of 1, the components shall 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 station.

Telecommunications operators must document their power supply systems and the included resilience of the power supply and their tests and keep these documents updated. Furthermore, these documents must describe the fulfilment of the resilience requirements set out in this Regulation, the location and technical specifications of devices, and maintenance arrangements.

10 Emergency power supply units

Emergency power supply units can be built using accumulators, UPS devices or other reliable equipment or systems that provide an uninterrupted power supply and fulfil the requirements set out in sections 8–16.

The operating condition and sufficient capacity of an emergency power supply unit shall be tested at least once a year and the test results shall be documented. The sufficiency of the emergency power supply unit's capacity shall also be checked

every time new devices are connected to the power supply system, or if the power consumption of the existing devices connected to the system increases.

If the back-up time of an emergency power supply required in this Regulation exceeds three hours, the emergency power supply unit shall be dimensioned so that it can feed all devices or systems needed for securing the operation of a communications network or system component during the required back-up time.

11 Accumulators

If the total capacity of an accumulator is more than 1,000 Ah, the capacity shall be divided between two parallel accumulators, unless special reasons prevent this.

Regarding communications network or service components with priority rating 4, if the structure or conditions of an equipment facility make it impossible to implement, at reasonable cost, the ≥ 6 -hour back-up time of the emergency supply unit by using an accumulator, the component in question shall be secured with a ≥ 3 -hour accumulator instead of a ≥ 6 -hour accumulator. The reason for derogating from the ≥ 6 -hour back-up time shall be documented, and it is prohibited to add new communications network or service components to the equipment facility or significantly increase the capacity of existing components.

Regarding communications network or service components with priority rating 5, if the structure or conditions of an equipment facility make it impossible to implement at reasonable cost the ≥ 4 -hour back-up time of the emergency supply unit, as referred to in footnote 6 to Table 2, by using an accumulator, the component in question shall be secured with a ≥ 3 -hour accumulator instead of a ≥ 4 -hour accumulator. The reason for derogating from the ≥ 4 -hour back-up time shall be documented, and it is prohibited to add new communications network or service components to the equipment facility or significantly increase the capacity of existing components.

12 UPS devices

If UPS devices are used as the only power supply unit or emergency power supply unit of a communications network or service component, the UPS devices shall be secured at minimum using N+1 redundancy and their accumulators shall fulfil at least the requirements for the back-up time of emergency power supply units defined in Table 2. However, N+1 redundancy is not required from UPS devices feeding an access network component if the component serves ≤ 30 subscriber connections.

13 Rectifiers

Rectifiers shall be dimensioned so that the power needed for the whole load can be fed in parallel to the discharged accumulator without a standby rectifier. The rectifier shall be able to recharge the discharged accumulator to 80 per cent of its nominal capacity within 48 hours in parallel with the load. A standby rectifier can also be used for recharging.

Rectifiers shall be secured with at least N+1 redundancy. However, this is not required from rectifiers feeding an access network component if the component serves ≤ 30 subscriber connections.

14 Inventers

Inventers shall be secured with at least N+1 redundancy. However, this is not required from inventers feeding an access network component if the component serves ≤ 30 subscriber connections.

15 Emergency power stations

Emergency power stations shall be dimensioned so that they can power all devices or systems needed for securing the operation of a communications network or system component.

A stationary emergency power station shall start automatically in the event of a power cut. The fuel storage tank of a stationary emergency power station and the amount of fuel shall be dimensioned for at least one week's use. If it is impossible to dimension the fuel storage tank of a stationary emergency power station and the amount of fuel to meet a week's demand because of a justified reason, a telecommunications operator shall take other measures to ensure that the fuel supply of the stationary emergency power station is sufficient for at least a week. This arrangement shall be documented.

A stationary emergency power station shall be kept functional all the time. The condition of a stationary emergency power station feeding a communications network or service component of priority rating 1 or 2 shall be tested at least every month by using the station for test use. The test use of an emergency power station feeding a communications network or service component of priority rating 1 or 2 shall be implemented at least annually so that the power supply for a load secured with the station is cut off from the public electricity network and the stationary emergency power station feeds the power that the load needs. The test use shall be continued at least for so long that all structural components of the stationary emergency power station have been confirmed to be operable and the motor rotating the generator has reached its normal operating temperature.

Telecommunications operators shall have at their disposal a sufficient number of properly operating mobile emergency power stations and enough personnel and transport equipment to operate and transfer them.

"An available mobile emergency power station" as referred to under priority ratings 1 and 2 in Table 2 means an arrangement which telecommunications operators use to ensure an uninterrupted power supply for a certain communications network or service component using a mobile emergency power station.

An available mobile emergency power station shall always be accessible and it shall always be possible to use the station to secure the power supply of a communications network or service component before the back-up time of its emergency power supply unit has expired, and the refuelling of the emergency power station shall be ensured throughout the time the station is needed.

If the power supply of a transmission system component with priority rating 1 or 2 cannot be secured using an emergency power station in accordance with the requirements presented in Table 2 for a justified reason associated with the location or properties of the equipment facility, the Finnish Transport and Communications Agency may exempt the telecommunications operator in question from the requirements.

The necessary connections required for a mobile emergency power station in Table 2 shall be implemented using a red 6-hour 3P+N+E appliance receptacle in

accordance with standard IEC 60309 and taking into account the power needed for the equipment facility if the current fed to the equipment facility is not more than 63 A.

Telecommunications operators shall maintain a written contingency plan for power cuts in the general electricity network using mobile emergency power stations. The plan shall specify at least:

- the number and power supply capacity of emergency power stations (reasons for the sufficiency of the quantity);
- geographic storage;
- maintenance and servicing during storage;
- delivery to locations of use; and
- operability at locations of use.

16 Power supply for telecommunications terminal equipment

The telephone traffic of a subscription in a public fixed telephone network must be possible with one telecommunications terminal also during power cuts in public electricity networks.

The power supply from an exchange or a concentrator in order to guarantee operations during a power cut is not obligatory if a repeater is needed for an ISDN subscriber line or if a telephone service offered up to customers is based on IP technology.

Telecommunications operators offering such an ISDN subscription or IP-based telephone service shall explicitly inform their customers of possible limitations in the telephone service during power cuts.

17 Protection of equipment facilities

Telecommunications operators shall ensure that their equipment facilities intended for public telecommunications operations at least meet the requirements for physical protection specified in Tables 3, 4 and 5 and elsewhere in this section.

Telecommunications operators shall maintain updated and document the physical protection of the equipment facilities.

Concerning transmission system components with priority ratings 1 or 2, if in the proximity of the location of the component there is no equipment facility meeting the requirements for the physical protection of the priority rating in question, the equipment facility housing the transmission system component shall meet at least the requirements for physical protection in equipment facilities with a priority rating of 3.

Telecommunications operators shall also ensure that the communications network or service components excluded from the priority rating are physically protected in such a way that they cannot be easily accessed by unauthorised persons.

Requirements for access control in equipment facilities for public communications networks and services are set out in Table 3.

Table 3. Access control in equipment facilities

Priority rating of equipment facility ¹⁾	Requirements
1	<p>The facility shall 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 shall be registered, and their access shall be controlled.</p> <p>The facility shall be equipped with a recording surveillance camera system.</p> <p>The facility shall be equipped with an automatic security alarm system that reports any intrusion into the facility from the outside.</p>
2	<p>The facility shall 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 shall be registered, and their access shall be controlled.</p> <p>The facility shall be equipped with an automatic security alarm system that reports any intrusion into the facility from the outside.</p>
3	<p>The locking of doors and access control in the equipment facility shall be implemented using at least door locks based on electronic keys. 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> <p>Any intrusion into the facility must trigger an alarm for monitoring employees.</p> <p>Electrical cabinets connected to the equipment facility that are directly accessible to unauthorised persons and that supply the electricity required by communications network equipment located in the equipment facility shall be locked using a key-operated mechanical or electromechanical lock.</p>
4 or 5	<p>All doors to the facility shall be locked with a key-operated mechanical or electromechanical lock.</p> <p>Any cabinets or boxes that are directly accessible to unauthorised persons shall be locked with a key-operated mechanical or electromechanical lock.</p> <p>Electrical cabinets connected to the equipment facility that are directly accessible to unauthorised persons and that supply the electricity required by communications network equipment located in the equipment facility shall be locked using a key-operated mechanical or electromechanical lock.</p>

1) The priority rating of equipment facilities is defined in section 4.

The requirements for the physical structures of the equipment facilities of public communications networks and services are set out in Table 4.

Table 4. Structure of the equipment facilities

Priority rating of equipment facility ¹⁾	Requirements
1	<p>The equipment facility shall be situated below ground or its surrounding structure shall comply at least with the requirements for a reinforced concrete shelter of protection class S1. The roof or ceiling and surrounding walls of an underground facility shall be made of reinforced concrete or similar material and they shall hold in case the building collapses. All structural materials in the facility shall, as a rule, be non-flammable.</p> <p>The structure, installation and locking systems of the doors to the facility shall hold against attempts to break-in with heavy tools.</p> <p>The equipment facility shall not have any exterior windows.</p> <p>Prevention of water damage shall be taken into account in the design and construction of the facility. If the floor of the facility is below the groundwater level or if water damage may otherwise occur, the facility shall be equipped with a leakage dewatering system which is not dependent on electricity supply from outside.</p>
2	<p>The roof or ceiling, floors and surrounding walls of the equipment facility shall be made of stone or steel and constructed in such a way that the wall elements cannot be removed from the outside intact. The roof or ceiling, floors and walls of the facility shall hold against break-in with conventional hand tools. All structural materials in the facility shall, as a rule, be non-flammable.</p> <p>The structure, installation and locking systems of the doors to the facility 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 shall be physically protected. Buildings that are located outside localities and are not permanently occupied may not have any exterior windows leading to the equipment facility.</p> <p>Prevention of water damage shall be taken into account in the design and construction of the facility.</p>
3	<p>The roof or ceiling, floors and walls of the equipment facility shall 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 out-side intact.</p> <p>The structure, installation and locking systems of the doors to the facility shall hold against attempts to break-in with conventional hand tools.</p> <p>The windows of equipment facilities located less than four metres above ground level shall be physically protected. In addition, the windows of facilities providing access to the equipment facility located less than four metres above ground level shall be physically protected. Buildings that are located outside localities and are not permanently occupied may not have any exterior windows leading to the equipment facility.</p> <p>Prevention of water damage shall be taken into account in the design and construction of the facility.</p>

4 or 5	<p>The structure, installation and locking systems of the doors to the facility shall hold against attempts to break-in without specific tools.</p> <p>Any cabinets or boxes that are directly accessible to unauthorised persons shall hold against attempts to break-in without specific tools.</p>
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1) The priority rating of equipment facilities is defined in section 4.

As an exception to the requirements for the structure of equipment facilities specified in Table 4, a telecommunications operator may place a component providing redundancy to a communications network or service component with priority rating 1 in equipment facilities whose surrounding structure only meets the requirements for priority rating 2.

Requirements for condition monitoring in equipment facilities for public communications network or service components are presented in Table 5.

Table 5. Alarms triggered by circumstantial factors

Priority rating of equipment facility ¹⁾	Requirements
1 or 2	<p>The facility shall be equipped with an automatic fire alarm system which will alert control personnel.</p> <p>If the temperature in the facility falls below or rises above set levels, the control personnel shall be alerted.</p> <p>If the floor of the facility is below the groundwater level or if water damage may otherwise occur, the facility 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 facility falls below or rises above set levels, the control personnel shall be alerted.</p>

1) The priority rating of equipment facilities is defined in section 4.

18 Protection of transmission links

The physical protection of transmission links shall comply with the requirements referred to in Table 6. When carrying out installation or excavation work for transmission links, the requirements set out in the SFS-EN 50174-3 standard shall be observed. Access networks may deviate from the minimum installation depths required in the standard, considering installation conditions, the cable structure, and its sufficient protection.

Submarine cables connected to a communications network component with a priority rating of 1 or 2 shall be protected as presented below, in compliance with the requirements set out in ITU-T Recommendation L.28.

Submarine cables built after 1 July 2021 shall be protected with shells and buried at a depth of at least two metres between the water's edge and the nearest beach manhole or equipment station. If the ground type does not allow burial, the cable shall be otherwise protected as possible, such as by means of shells. Close to the shore between the water's edge and a water depth of five metres, new submarine cables shall be protected with shells and buried at a depth of one metre at the sea bottom. If the sea bottom does not allow burial, the cable shall be otherwise protected as possible, for example by using sandbags.

Submarine cables built after 1 July 2021 shall be buried at the sea bottom at a depth of one metre, also from a water depth of five metres up to a water depth of 30 metres, if possible; however, at least 500 metres away from the landing point. If the sea bottom does not allow burial, the cable shall be otherwise protected as possible, for example by using sandbags.

Telecommunications operators shall maintain updated and document the physical protection of transmission links.

Requirements for the physical protection of transmission links are presented in Table 6.

Table 6. Physical protection of transmission links

Transmission link/equipment facility	Requirements
Connection points, cable terminations and cable joints	Any connection points, cable terminations or joints that are accessible to unauthorised persons directly or 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 electromechanical locking system.
Manholes	Manholes providing access to the equipment facility shall be locked. Manholes with connection points or equipment shall be locked, or, alternatively, the connection points and equipment shall be locked. The appearance of the manhole should not suggest the importance of the connections it contains. Beach manholes of new submarine cables shall be locked. Existing uncovered or unlocked beach manholes of submarine cables shall be locked or protected by means of covering or filling them with gravel.
Antenna masts	Antenna masts shall be physically protected against attempts to break-in, climbing and vandalism. This shall be done by taking into consideration the surrounding environment.
Cables	Any cables that are visible and easily accessible outside the equipment facilities shall be protected; however, this shall not apply to antenna mast cables.

19 Implementation of frequency synchronisation

Communications networks shall be synchronised so that the quality of communications network connections and services fulfils the requirements for wander limits and slip rates as specified in ITU-T Recommendation G.822.

Communications networks shall be synchronised with a primary reference clock (PRC) system via a synchronisation network.

The structure of the synchronisation network shall comply with the relevant standards and its performance shall meet the values defined in standards.

A hierarchical master-slave synchronisation method shall be used in the synchronisation network.

A synchronous or pseudo-synchronous operating mode shall be used in operations between communications networks.

Communications networks shall be synchronised with a PRC system located in Finland, which must fulfil the requirements set out in section 20 of this Regulation.

Synchronisation connections of synchronisation network nodes shall have redundancy. Primary and secondary synchronisation connections shall be selected so that the synchronisation will not form a loop in any situation.

The telecommunications operator that provides synchronisation shall present documents about its transmission chain from the primary source to the receiving telecommunications operator.

20 Requirements for synchronisation clocks in frequency synchronisation

The primary reference clock (PRC) system with which the communications network has been synchronised shall comply with the requirements set for PRC systems in standards.

Other synchronisation clocks shall fulfil requirements set for synchronisation clocks at the specific hierarchical level in standards.

Clocks in synchronisation network nodes must be redundant.

21 Resilience of time and phase synchronisation

Time and phase synchronisation obtained through the Global Navigation Satellite System (GNSS) shall have redundancy by using fixed networks so that time and phase synchronisation is sufficiently accurate for at least two weeks if synchronisation via GNSS is not available.

Telecommunications operators may deviate from the two-week resilience period set for time and phase synchronisation regarding individual base stations if it cannot be implemented at reasonable cost. Telecommunications operators shall, by the end of the transitional period, document the information about such base stations commissioned by that time and their locations, as well as detailed information about the reasons why resilience cannot be implemented at reasonable cost within the transitional period. With respect to any similar base stations commissioned

after the end of the transitional period, the above-mentioned information shall be documented by the end of each year. In the same connection, telecommunications operators shall also document information on any base stations that have been subject to the exceptions referred to above but for which resilience has been implemented during the year in question.

22 Maintenance and documentation of synchronisation

Telecommunications operators shall maintain updated and document the synchronisation arrangements of their communications networks.

23 Entry into force and transitional provisions

This Regulation enters into force on 1 July 2021 and will remain in force until further notice.

Mobile networks' basic coverage area base stations constructed or under construction before this Regulation enters into force and the emergency power supply units and rectifiers of their transmission systems shall fulfil the resilience requirements for power supply referred to section 8 of this Regulation as follows:

- LTE network base stations: by 31 December 2023 regarding the back-up time of ≥ 3 hours for emergency power supply units as required for priority rating 5 in Table 2, and the back-up time of ≥ 4 hours and ≥ 2 hours as required in footnote 6 of Table 2, and
- 5G network base stations: by 31 December 2021 regarding the back-up time of ≥ 15 minutes for emergency power supply units as required in footnote 6 of Table 2.

Until this time, these base stations and the emergency power supply units and rectifiers for their transmission systems shall meet at least the resilience requirements laid down in FICORA Regulation 54B/2014 M.

Emergency power supply units constructed or under construction before this Regulation enters into force shall be tested and the test results documented in accordance with section 10 of this Regulation by 31 December 2022. Until this time, checks to ensure the operation and capacity of emergency power supply units shall meet at least the requirements laid down in FICORA Regulation 54B/2014 M.

Beach manholes of submarine cables constructed or under construction before this Regulation enters into force shall fulfil the requirements for the protection of transmission links defined in section 18 of this Regulation, as follows:

- Existing uncovered or unlocked beach manholes of submarine cables shall be locked or protected by means of covering by 31 December 2022.

Equipment facilities constructed or under construction before this Regulation enters into force shall meet the requirements for the protection of equipment facilities defined in section 17 of this Regulation as follows:

- The locking of doors and access control in the equipment facility with priority rating 1 shall be implemented using at least door locks based on electronic keys by 31 December 2022.
- Electrical cabinets in equipment facilities with priority ratings 3, 4 or 5 that are accessible to unauthorised persons directly or without any instruments and

that supply the electricity required by communications network equipment shall be locked using a key-operated mechanical or electromechanical lock by 21 December 2022.

Until this time, the equipment facilities in question shall meet at least the protection requirements laid down in FICORA Regulation 54B/2014 M.

Time and phase synchronisation obtained via GNSS shall be secured through a fixed network in accordance with the requirements in section 21 of this Regulation by 31 December 2022.

24 Signatures

Helsinki 17 June 2021

Kirsi Karlamaa
Director-General

Sauli Pahlman
Deputy Director-General