Pohjola Insurance

Safety regulations for power plants S970

Your obligation to prevent damage, Valid as of 1 January 2023

Welcome to read the protection guide!

Your business has an obligation to prevent damage. In these safety regulations, we explain what your company must do and take into consideration to prevent damage to power plants.

Read the regulations carefully. If you do not comply with the regulations, we may reduce or deny your insurance compensation.

These safety regulations are part of your insurance contract

Your insurance contract consists of the policy document, insurance terms and conditions, safety regulations, and the general contract terms and conditions.

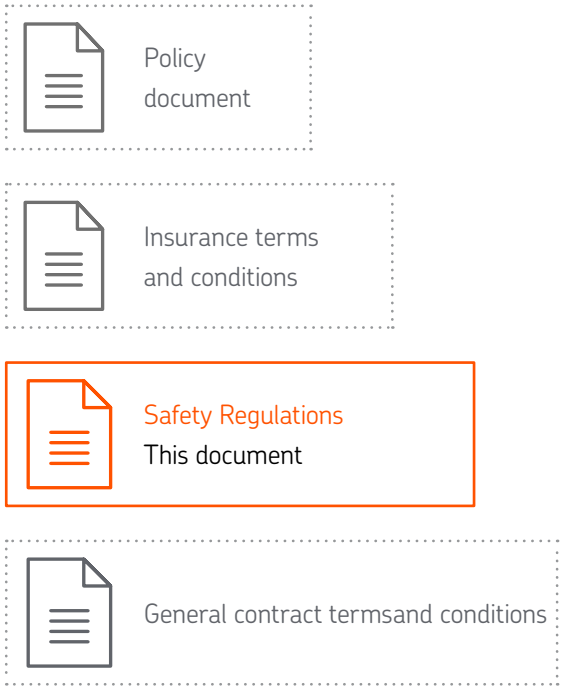
The **policy document** lists your company's insurance policies and the terms and conditions applicable to them.

The **insurance terms and conditions** describe the terms under which your property is insured.

The **safety regulations** describe your company's obligations to prevent damage.

The **general contract terms and conditions** list terms that apply to all insurance policies issued by Pohjola Insurance.

Tulkitsemme vakuutuskirjaa, vakuutusehtoja, suojeluohjeita ja yleisiä sopimusehtoja kokonaisuutena.



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1 Purpose of the safety regulations: prevention of damage to power plants

The purpose of these safety regulations is to prevent property damage and business interruption losses to power plants and reduce the costs of such damage. The safety regulations describe the general requirements for damage prevention at power plants.

Power plant refers to an assembly that includes

- a turbine
- other machinery and equipment generating heat and electricity, and
- a power plant building that uses steam, heated gases or flowing water to generate heat or electricity

Your business has an obligation to ensure that

- ✓ the safety regulations are followed in all activities carried out by the policyholder or its equivalent
- ✓ those responsible for performing the work are familiar with the contents of the safety regulations
- ✓ you report all deviations detected in the machinery or equipment to us in writing
- ✓ in the event of an elevated risk, you acknowledge the risk and agree on the related measures with us in writing in advance

2 Requirements for the maintenance of power plants

> ⓘ Maintenance of power plants must be based on preventive maintenance. Follow the manufacturer's instructions for preventive maintenance.

✓ **Ensure** that all maintenance work is performed by competent operating and maintenance personnel.

✓ **Ensure** that maintenance and outages are carried out by personnel with the relevant professional qualifications

Preventive maintenance refers to activities that maintain the power plant's functionalities and reduce risk of damage.

Preventive maintenance includes:

- monitoring of conditions
- continuous monitoring of the condition of power plant systems, and
- periodic inspections, and
- periodic maintenance

The **maintenance programme** is a machine and device-specific set of instructions by the power plant's manufacturer on preventive maintenance, including condition monitoring, inspections, testing, servicing, and operational monitoring.

The maintenance programme must include the following items:

- measures related to operational monitoring of the power plant
- measures related to periodic inspections
- and maintenance measures

✓ **Document** all inspections, maintenance, tests and outages.

- **Inspection** refers to investigating the functional capacity of the power plant. Inspection also involves testing to confirm that the power plant is operating as intended.
- **Maintenance** refers to periodic measures taken to maintain the functional capacity of the power plant, as well as measures taken after the detection of an error to restore the plant to its original functional capacity.
- **Outage** refers to periodic maintenance.

✓ **Ensure** that the documentation is always available to us in the event of loss or damage or for risk management meetings.

✓ **Notify** us in writing if a deviation endangering the operational reliability of equipment or systems is detected during inspections, testing or outages. Report the deviation to us in writing before continuing the use of the equipment or system.

✓ **Notify** us in writing if a machine or equipment does not conform to class A of the mechanical vibration standard ISO 7919.

✓ **Obtain** a written approval from the equipment manufacturer or us if you plan to use repair methods that differ from those recommended by the manufacturer.

3 Requirements for the operational safety of power plants

ⓘ Ensure that the power plant has an up-to-date rescue plan in place.

- ✓ **Train** personnel on the rescue plan and safety instructions.
- ✓ **Ensure** that the power plant is equipped with up-to-date safety instructions and signage.
- ✓ **Ensure** that the safety instructions include detailed instructions for alerting emergency services, including directions to the power plant.
- ✓ **Ensure** that all persons at the power plant wear appropriate personal protective equipment.
- ✓ **Ensure** that facilities at the power plant are kept in good order and clean to ensure safety at work and prevent accidents.

4 Fuel requirements

- ✓ **Only use** fuel approved by the boiler manufacturer.
- ✗ **Do not mix** wood, plastic, mixed waste and oil-based fuels.

5 Outages

- ✓ **Perform** the turbo generator outage according to the manufacturer's instructions.
- ✓ **Follow** the values listed in the maintenance reference table in section 14 of these safety regulations if the manufacturer's outage instructions are over 30 years old or unavailable.

6 Requirements for the prevention of fire damage

ⓘ Due to fire safety reasons, smoking is prohibited in all areas of the power plant.

- ✓ **Inspect** automatic fire extinguishing and detection systems monthly.
- ✓ **Document** the monthly inspections.
- ✓ **Immediately** repair any issues detected in the periodic inspections of fire detection and extinguishing systems.
- ✓ **Inspect** hand-held indoor fire extinguishers every two years.
- ✓ **Inspect** hand-held fire extinguishers stored outdoors or in facilities vulnerable to vibration every year.
- ✓ **Ensure** that flammable liquids and gases are stored in a separate ventilated and fire compartmented space.
- ✓ **Use** only CE-marked and type approved fire foams for sealing lead-throughs. Fire foams may only be applied to lead-throughs by a certified firestop technician

Hot Work

- ✗ **Do not** perform hot work unless necessary.
- ✓ **Follow** the safety regulations for hot work, S621.
- ✓ **Perform** all hot work according to the instructions for temporary hot work locations.

Conveyors and fuel feed systems

- ✓ **Ensure** that conveyors used to transport flammable materials are equipped with automatic fire extinguishing systems.
- ✓ **Equip** conveyors with fire alarms that stop the conveyor in the event of fire.
- ✓ **Equip** separate conveyors with fire alarms that allow the conveyor to be stopped separately.

7 ATEX – Explosive atmospheres

What is an explosive atmosphere?

In an explosive atmosphere, flammable gas, fog, steam or dust can cause an explosive mixture of air with normal-pressure air.

Explosive atmospheres are mainly found in connection with handling flammable liquids, gases and dust. These handling situations happen in

- energy production,
- chemical, medical, food, and wood processing industries and
- usually in the preparation, processing or storage of flammable liquids or gases

ATEX – explosion protection document

The explosion protection document is based on

- danger assessments concerning the substances handled at the site and their properties,
- safety inspections and
- instructions on the handling and storage of chemicals, as well as fire safety

These obligations concern the employer and entrepreneurs as applicable:

- ✓ **Assess** the danger of explosion and prepare an explosion protection document based on the assessment if the work may include dangers caused by explosive mixtures of air.

ATEX - Electrical equipment for potentially explosive atmospheres

- ✓ **Ensure** that the electrical equipment and protection systems used in the potentially explosive atmosphere fulfil the health and safety requirements and the demands laid down in the ATEX directives.

More information on ATEX regulations and the conformity of equipment is provided by the Finnish Safety and Chemicals Agency Tukes.

8 Steam boilers

- ✓ **Ensure** that the steam boiler's structures and systems conform to laws, regulations and standards**.**
- ✓ **Follow** the manufacturer's operating instructions.
- ✓ **Test** the steam boiler's safety systems according to the manufacturer's or supervisory authority's requirements. The supervisory authority is the Finnish Safety and Chemicals Agency Tukes

9 Steam, gas and water turbines

Operation and monitoring

- ✓ **Ensure** that steam and gas turbines are monitored at all times during operation.
- ✓ **Stop** the turbine if the values deviate from the manufacturer's permitted values.
- ✓ **Investigate** the cause of the deviation.
- ✓ **Repair** all malfunctions before attempting a restart.
- ✓ **Ensure** that the turbine is equipped with safety systems approved by the manufacturer that issue an alarm and initiate emergency shutdown if necessary.
- ✗ **Do not** alter the turbine's method of operation or nominal values without the manufacturer's separate written approval or instructions.
- ✓ **Always agree** on changes to the method of operation or nominal values ahead of time and in writing with both the equipment manufacturer and the insurance company.

Outages

- ✓ **Perform** the turbine outage according to the manufacturer's instructions.
- ✓ **Follow** the values listed in the maintenance reference table in section 14 of these safety regulations if the manufacturer's outage instructions are over 30 years old or unavailable.

10 Transmission

- ✓ **Follow** the transmission system connecting the turbine and generator if one exists.
- ✓ **Shut down the turbo generator** if measured values deviate from the manufacturer's permitted design values.
- ✓ **Investigate** the cause of the deviation.
- ✓ **Repair** the transmission system before attempting a restart.

11 Generator

- ✓ **Monitor** the generator at all times during operation.
- ✓ **Stop** the generator if the values deviate from the manufacturer's permitted values.
- ✓ **Investigate** the cause of the deviation.
- ✓ **Repair** all malfunctions before attempting a restart.
- ✓ **Ensure** that the generator is equipped with safety systems approved by the manufacturer that issue an alarm and initiate emergency shutdown if necessary.
- ✗ **Do not** alter the generator's method of operation or nominal values without the manufacturer's separate written approval or instructions.
- ✓ **Always agree** on changes to the method of operation or nominal values ahead of time and in writing with both the equipment manufacturer and the insurance company.

12 Transformers

- ✓ **Ensure** that the transformer bay is fire compartmented if the transformers used are class F0.
- ✓ **Always** fire compartment transformer bays that use medium-voltage switchgears.
- ✓ **Use** dry-type transformers whenever possible
  - Dry-type transformers have better fire safety and cause less environmental load compared with oil-filled transformers as they do not use large amount of oil that increase fire load.

Dry-type transformers

Fire class	Status
F0	Not self-extinguishing
F1	Self-extinguishing, does not sustain fire
F2	Withstands external fire up to a point

Fire compartmentation requirements of different transformer types

Location of the transformer	Type 01 transformer		Type F0 transformer or medium-voltage switchgear	
	Load-bearing structures	Compartmented structures	Load-bearing structures	Compartmented structures
Up to floor 2	R 120	EI 120	R 60	EI 60
Floors 3 to 8 or basement	R 180	EI 120	R 120	EI 60
Above floor 8 or below basement level	R 240	EI 120	R 120	EI 120

Oil filled transformers

- ✓ **Protect** oil-filled transformers with suitable automatic fire extinguishing systems.
- ✓ **Equip** the transformer bay with an oil tray.

13 Electrical equipment

- ✓ **Commission and perform** statutory periodic inspections for electrical equipment on time.
- ✓ This obligation applies to both the owner and holder of the electrical equipment.

Equipment category	Equipment asset	Inspection interval
Category 3	Electricity networks of network companies	5 years
Category 2	equipment including parts with a voltage higher than 1,000V low-voltage equipment with a connection power of over 1,600kVA	10 years
Category 1	Pääsulakkeiltaan yli 35A:n sähkölaitteistot (liike-, julkiset- ja teollisuusrakennukset, maatalousrakennukset, yleisten paikkojen asennukset)	10 years

14 Maintenance instructions

> ⓘ Take into account the manufacturer's maintenance instructions in estimating operating hours and, if the manufacturer's maintenance instructions are deviated from, request the insurance company's approval for the measure

Defitinions

- **A turbine** is a steam, gas or water powered, rotating device generating more than 1 MW of mechanical power
- **A generator** is a device used to generate electricity with a power of more than 1 MVA
- **A boiler** is a device used to create superheated steam with a power of more than 1 MW

Take into account the manufacturer's maintenance instructions in estimating operating hours and, if the manufacturer's maintenance instructions are deviated from, request the insurance company's approval for the measure.

✓ If the manufacturer's maintenance instructions on estimating operating hours are not available, follow the reference below

- Perform service life estimates and maintenance as follows (equivalent operating hours (EOH) = operating hours that take into account the number of start-ups).

Object of maintenance	Operating hours or time period	Maintenance measure
Superheaters	If over 100,000 (EOH)	Thickness and oxide coating measurements once a year
	If superheaters used for over 250,000 EOH	Assessment of remaining service life every 36 months
Boiler drum		Internal NDT of the spray area once a year
	If boiler drum used for over 200,000 EOH	Assessment of remaining service life every 24 months
Turbines	Minor maintenance (25,000 EOH)	endoscopy imaging of blades, NDT of quick-closing valves, control valves and bearings
	Major maintenance (50,000 EOH)	complete NDT of blades and rotating parts
Generators	If the generator has been used for over 100,000 EOH	Partially destructive testing during operation once a year (PD on-line)
	Minor maintenance (25,000 EOH)	visual, endoscopy and electrical inspections, including direct current measurement of insulation resistance and coiling, partially destructive measurements (PD off-line) and inspections of the diode and magnetisation system.
	Major maintenance (70,000 EOH)	mechanical and electrical inspections of the stator and rotor, including ELCID inspection of the stator core and inspection of wedges
Gearboxes	Minor maintenance (25,000 EOH)	NDT of bearings
	Major maintenance (50,000 EOH)	complete NDT of gearwheels and bearings
Oil analysis		Oil analysis of the turbo generator every 24 months

By following these regulations, you will ensure occupational safety and avoid unpleasant surprises in the event of an insurance claim.

Thank you for taking the time to read these safety regulations!

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Regulatory authority: Financial Supervisory Authority, finanssivalvonta.fi/en

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