

SAFETY IS ALL ABOUT ATTITUDE, PROACTIVITY AND COOPERATION.

SAFETY RULES OF KEMIJOKI OY

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Foreword

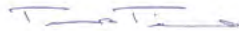
SAFETY IS ALL ABOUT ATTITUDE, PROACTIVITY AND COOPERATION

HYDROELECTRIC POWER PRODUCTION must always be reliable, well-planned and responsible. Safety is a natural and important part of all our operations.

We are jointly responsible for safety. It means that we do our work diligently while also looking after each other and our working environment.

Each task includes a plan for carrying out the work with safe foresight and cooperation. Safety is a joint decision, not a matter of chance. We must be able to rely on all our co-workers having committed themselves in safety.

Please study these rules carefully. If you notice any scope for improvement in safety, do not hesitate to bring the matter up - this way, we can prevent many accidents that should never have happened. Safe working days!!



TUOMAS TIMONEN
Managing Director

We are constantly developing our operations. We welcome your feedback regarding these safety rules. Share your observations with your Kemijoki contact person. Our website (www.kemijoki.fi) has the contact details and feedback channel through which you may also provide us with feedback on the safety instructions.

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RESPONSIBILITIES AND OBLIGATIONS OF THE BUYER

It is the responsibility of the buyer to ensure the production system meets all legislative and regulatory requirements. The buyer is responsible for examining and evaluating the special characteristics of each work site. The obligations of the buyer include induction training for service providers and their staff on the work site and its environment to the extent it is necessary, and contributing to the safety of the work sites by all possible means. The buyer will prepare, for its part, the safety documents the contractors and service providers complement with their safety plans.

The buyer monitors the realization of issues defined as constituting safety through, for example, documents, work-site meetings and visits to the work site. The buyer has the responsibility to intervene if the buyer observes negligence or deficiencies in safety procedures.

RESPONSIBILITIES AND OBLIGATIONS OF THE SERVICE PROVIDER

The service provider is responsible for ensuring the work is carried out in a safe manner and in compliance with work safety legislation, written work safety documents and jointly agreed work practices. The service provider is responsible for creating a positive and safe environment for working by taking care of the appropriate standard and continuous development of their staff, subcontractors, work equipment and work processes. The special characteristics of each work site must be examined and taken into account during the safety planning process.

The safety instructions must be observed without exception. Everyone is obliged to report any problems they observe. The special characteristics of each work site must be taken into account, and the information security must be guaranteed.

General issues to consider on work-specific basis, among others

- The service provider must appoint a supervisor responsible for the work.
- The service provider may only use subcontractors approved by Kemijoki Oy. The service provider is also responsible for the induction training of its subcontractors and for monitoring observance of the instructions.
- All persons must wear a visible ID card.
- Connecting computers to the data network of Kemijoki Oy is only allowed by a written permission.
- All technical, financial and production-related matters concerning the power plants are confidential and must not be divulged to third parties.
- In case of serious or repeated failures to observe safety instructions, the person's access to the work sites of Kemijoki Oy may be prevented.

The instructions in this safety manual may only be deviated from for compelling reasons, and the deviation or alternative plan must be approved by the person's manager. Instructions and induction training must be provided for any alternative safety solutions.

GETTING TO KNOW SAFETY

Before starting work at any of Kemijoki Oy's power plants or other facilities, the person must complete **Kemijoki Oy's general safety training**. The training applies to the personnel of Kemijoki Oy, its partners and subcontractors.

[Safety training](#) (available only in Finnish)

After completing Kemijoki Oy's general safety training, the induction will continue as follows:

1. Ensure before arrival at the site that the person

- has received professional training provided by the service provider
- has the required professional qualifications, correct working methods and tools
- holds an occupational safety card (issued by The Centre for Occupational Safety)
- has the general capabilities for working in an industrial environment and in a joint place of work

Please note: A procedure deviating from the above can be agreed upon when the situation so dictates or in case the work is of short duration. This requires that the person works under the constant guidance and supervision of his/her manager.

2. Before starting work

- discuss these safety rules
- familiarise everybody with the particular features of hydroelectric power plant environments – the hazards and preparing for them
- study the risk assessment and safety plan produced by the supplier
- analyse the work-specific hazards and preparations for them
- produce a safety report: integration of different tasks and making the site safe
- ensure that Kemijoki or its operating personnel inform the employees of local conditions and record the names of those attending this safety briefing
- the person responsible for operations will define the need for the work permit on the safety report and guide you how to apply for the work permit

3. During the work

- discuss the methods of proactive safety work:
 - last-minute risk assessment
 - safety-related observations
 - safety briefings
 - conversational safety rounds

SAFETY REPORT AND SAFETY PLAN

A safety report must always be submitted for work carried out in the vicinity of machinery and switchgear as well as in the river bed near power plants and flood gates.

The safety report is produced by the person responsible for the work. In general the safety report shall be prepared at least one week before the works start. Occasionally the O&M partner can prepare it 3 working days before starting their own works. The safety report is supplemented with a safety plan for separate operations.



ACTIONS FOR ENSURING SAFETY

The following primary measures will be used for ensuring safety:

1. Eliminate or mitigate the hazard

- choose an alternative method, location or time for the work

2. Select the technical solutions

- isolate and protect the hazardous areas

3. Observe the instructions given and use personal protective equipment

- choose the safest method of work

These primary measures are most effective, but they cannot always be used in maintenance or repair work. That is why the agreed methods must be used without exception. Secondary measures require the managers to participate more and to provide more guidance.

INSTRUCTIONS FOR SAFE WORKING



The following instructions must be observed when moving about and working at work sites.

PROACTIVE SAFETY WORK

We want everyone to join the proactive safety work. Proactive safety work will be reported in a manner to be jointly agreed upon.

Proactive safety work includes:

1. SAFETY BRIEFINGS

SAFETY BRIEFINGS are part of induction training. Risk assessments specific to work phases, safety observations and possible documented interpretations of hazardous situations are utilised in safety briefings. The subjects for the 5-15-minute safety briefings are introduced by managers.

2. LAST-MINUTE RISK ASSESSMENT (THE STOP-THINK-ACT ROUTINE)

LAST-MINUTE RISK ASSESSMENTS supplement the earlier risk assessments specific to work phases. The assessment ensures that the risk management measures specified earlier are followed in the work. Earlier risk assessments are supplemented with regard to risks associated with the current moment and the work at hand. The assessments are made by persons performing installation and construction work.

3. SAFETY-RELATED OBSERVATIONS

SAFETY-RELATED OBSERVATIONS are made as part of risk management and safety cooperation during work. The number of safety-related observations and the number of persons reporting them are an indication of functional self-monitoring. Safety observations are made by all persons working in the project.

4. CONVERSATIONAL SAFETY ROUNDS AT PLACES OF WORK (SAFETY DISCUSSIONS)

CONVERSATIONAL SAFETY ROUNDS encourage employees to and prepare them for making last-minute risk assessments and safety observations and to follow the safety rules. The managers carry out safety rounds of 15-30 minutes.

VISITORS

We also want to ensure safe conditions for our visitors. The host is always responsible for the safety of visitor groups.

In addition to the safety rules of work sites, a separate safety guide for visits is observed. The host of the visit introduces the safety guide to visitors.



MOVING WITHIN THE POWER PLANT AREA

- Entering the power plant area must be agreed with the buyer and the person responsible for operations in the area who provides the control room with the necessary reports. Control of the fire and burglar alarm systems is agreed upon in connection with providing the reports.
- Exceptional working hours, working alone and other deviations regarding work and access must be agreed upon in advance with the buyer and the person responsible for operations in the area.
- Vehicles must be parked in the designated spaces.
- Bringing intoxicants to the area and being under their influence is absolutely prohibited. Smoking is only permitted in the designated areas.
- The power plant has limited personnel facilities for changing, washing and meals.
- The arrangement and location of personnel facilities for project sites will be specified in separate plans.
- Photography and shooting videos is only allowed if permission has been granted by Kemijoki Oy.
- Recording camera surveillance is used at the premises.
- Be careful not to slip or tumble and always hold on to the staircase rails.
- Be mindful of the risks of using phones and smart devices. Use these devices only in safe areas.
- Find out the location of the nearest emergency exit and muster station.

PREVENTION OF ENTRY TO THE DANGER ZONE

Prevention of entry to the danger zone is part of work planning. The protection must cover persons working at the work site and those visiting it. When working outside a fenced area, other persons in the area must also be taken into account. The section titled "Actions for ensuring safety" must be observed when choosing the appropriate work methods.

WORKING IN THE RIVER BED AND NEAR MACHINERY AND SLUICE GATES

The flow rates near the plant and the dam may quickly change. The change may be caused by a production change or a fault situation. When working in the vicinity of machinery and dam sluice gates, their remote control must be taken into account. A sound alarm is given when the sluice gates are opened.



TRAFFIC

Temporary traffic arrangements affecting the general traffic must be planned in cooperation with the representative of Kemijoki Oy. The temporary traffic arrangements of project sites and locations of heavy traffic are presented in the work site area plan. The Roadwork Safety qualification is required for working in public road areas.

WORK EQUIPMENT AND TIDINESS

Use only inspected tools

The tools must be intended for professional use and inspected before bringing them to the work site. Furthermore, the user must always check the condition of the power cord, protective equipment and operating switches of tools before starting work. Use of out-of-order equipment is prohibited.

All operators of tools and machines must be instructed in their use.

Cleanliness and tidiness are elements of safe working methods

- Access and exit routes must be kept free of any obstructions.
- Waste materials must be sorted in compliance with local instructions.
- When working on platforms, materials must be prevented from rolling or falling off the platforms.
- Material and dismantled parts must be put into interim storage in a reliable manner.
- Machine shop work and dismantling work at the power plants requires the written permission of Kemijoki Oy.
- In project sites, cleanliness and orderliness are part of the areal plan for the site and the plan regarding power distribution during the work.
- Tidying up the work site after completion is part of the work. If required, the work site will be tidied up at the supplier's cost.



PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment to be used at work sites:

- head protection
 - helmet: project sites, construction work, annual maintenance and installation work
 - industrial bump cap: minor maintenance work during operation
- eye protection
- safety shoes
- signal-coloured protective clothes
- earmuffs (noisy areas)
- protective gloves (when required by the work)
- supplementary protective clothes (when required by the work)

The requirements for personal protective equipment will also be supplemented and further specified in work-related risk assessments and work-specific instructions.

PROTECTION AGAINST FALLS

The instructions regarding **ladders, trestles and other platforms** must be observed.

Lean-to ladders must not be used as a work platform.

Lifting platforms may only be used with the supervisor's permission.

Scaffolding may only be erected, moved and dismantled by a person trained for the task. Scaffolding must be inspected before use, after modifications and exceptional weather conditions and at one-week intervals. The inspection, possible ban on use and maximum loading are recorded in the scaffolding card. A usage and structure plan must be produced for special scaffolding if it is not of element structure, if it has special anchoring or used for a non-standard purpose.

When **protection against falls** is used, the solutions for rescuing persons who have fallen to the fall protection equipment must also be specified.

At project sites, the risks of falls are managed on the basis of a plan for protection against falls. The plan shall describe the particular characteristics of the site, the work phases, as well as the methods and principles for protection.

ELECTRICAL SAFETY



High-voltage systems may give life-threatening **electrical shocks even without direct contact**, because electrical current can pass through a gap in the air (arc). The risk of electrical shocks and arcing exists in the vicinity of electrical cables or other uninsulated live equipment and their parts. The required protection and allowed safe working distances are specified in safety plan and during local induction training.

Electrical systems generate **electromagnetic fields**. Electromagnetic fields may cause disturbance currents in their environment. Observe the safety distances and note that electromagnetic fields may cause **disturbances in medical equipment**, such as pacemakers.

Electrical facilities, switchyards and transformer stations must be kept locked. Persons who are not electrical work professionals may only work in these facilities under constant supervision or after having been familiarised with the local electrical safety issues. The procedure will be specified in connection with local induction training. Further information is available from the head of electrical installations at Kemijoki Oy or the head of electrical work at the service provider.

The basics of electrical safety

1. Make sure to isolate the work site securely from all power sources and input directions.
2. Prevent the electrical power from switching on through mechanical locking.
3. Verify that there is no voltage.
4. Temporarily earth the supply directions and parts that are susceptible to electromagnetic induction.
5. Secure and mark the work area.
6. Ensure and communicate the electrical safety of the work area to everyone.
7. Be professional by following and monitoring all of the electrical safety measures.

PROCESS ISOLATION AND PREVENTION OF ACCIDENTAL STARTS

Power plants and dam equipment are remotely started and automatically controlled. Work must not commence before the work site has been secured to zero power state and the following matters have been taken into account: electricity, flowing media, hydraulics, pneumatics and mechanical energy. This means that:

- The work site has been isolated from all power sources.
- Any stored energy has been discharged.
- Inadvertent restoration of power has been prevented with locks and markings.
- The reliability of isolation measures has been verified by test starting, if required.

If locking the electrical isolation device (e.g. safety switch) is not technically possible, the electrician can remove the fuses and prevent their inadvertent reinstallation by reliable means. Blinding*, removal of a pipe fitting or closing of successive valves and opening of an intermediate fitting shall be used for flowing of pressurized media. Safety circuits, danger lines, safety functions of safety doors or limit sensors are not reliable means of isolation.

The person responsible for local induction training makes the work site safe in compliance with the machinery-specific safety instructions. For project sites, the organisation of making the work site safe is specified as part of the main contractor's safety plan.

High-voltage connection work and other demanding connection work are always implemented in accordance with the written connection schedule and under the guidance of the head of connection work.

Connections in case of disturbances and emergencies are made in accordance with the instructions provided by the head of connection work. Before starting work, it must be verified that the latest version of the connection schedule is in use.

*To blind a pipe, one must first close the tank's cut off valve that separates the pipe connection, after which a blind flange is installed into the cut off valve.

SITE-SPECIFIC INSTRUCTIONS

EXCAVATION WORK

An excavation plan for the work site must be produced if there is a risk of caving in or if the excavation is to be more than two metres deep.

The risk of caving in is increased by:

- extracted soil dumped closer to the edge of the excavation than its depth
- ground frost and major boulders remaining in the excavation
- vibrations (e.g. traffic-induced)
- high level of groundwater and torrential rains

When planning the excavation work, the locations of underground cables must be surveyed and the safety distances to high-voltage parts must be observed.

Excavation to be carried out on dam structures or in their vicinity requires the written permission to start work issued by the dam safety expert of Kemijoki Oy.

Blasting and quarrying work shall be performed in accordance with separate safety plans and regulations issued on their basis.

Report all observations which might affect dam safety to the work supervisor.

LIFTING WORK

A plan is always required for lifting work. A written lifting plan approved by the manager is required, if the work entails any of the following:

- risk of not respecting the safety distances of high-voltage objects
- lifting over active hydroelectric power machinery
- over 80% of the crane's capacity is used
- several cranes are used (e.g. a pulley tackle)
- risk of oblique loading
- a hook designed as an open hook is used
- no direct visual contact
- a person in a cage is lifted by a crane
- flow of information, competence or change management requires verification

The risk of falling load must be assessed in case of lifting over active hydroelectric machinery. If a falling load may damage machinery in operation, the machinery must be stopped for the duration of the lifting operation (e.g. when lifting a stator or a rotor).

The cranes and lifting gear of Kemijoki Oy can be used by a person who has received guidance in local induction training and who also holds his/her employer's permission to perform lifting work. Any problems or events affecting the operating condition must be immediately reported to a representative of Kemijoki Oy.

The method of supporting large objects during the work and temporary placement must be presented as part of the lifting work plan, as must the haulage work phase. When cranes fitted on vehicles are used, the location and load-bearing capacity of underground structures must be verified. The maximum loads specified for the floor and dam structures of power plants must not be exceeded.

HOT WORK

Hot work includes all actions that create a fire hazard: sparks, flames or hot temperature. Preferably, use an alternative work method or perform the hot work in the permanent hot work site. Permanent hot work sites are marked (in Finnish) as "*Vakituinen tulityöpaikka*".

Before starting work, ensure that the permanent hot work site has no flammable materials and that the spreading of sparks is prevented. If the object worked on using hot work materially increases the risk of fire, the requirements for temporary hot work shall be observed.

Working in a temporary hot work site requires that the precautionary measures specified in the hot work permit have been taken. The persons carrying out hot work and fire watch during and after the work must hold valid hot work cards. The fire watch is continuously the responsibility of the person carrying out the hot work. The duration of fire watch after the work is one hour, unless otherwise specified in the hot work permit. When required, a hot work permit is issued in connection with local induction training.

Permanent hot work sites can be established at project sites for the duration of the project. The establishment of these sites requires fulfilment of the requirements for permanent hot work sites and the written approval of Kemijoki Oy.

Hydrogen gas may form in battery rooms. This risk is managed by ventilation and charger regulation, as well as by avoiding work causing sparking and other fire hazards in the battery rooms.

DISMANTLING WORK

The risks of dismantling work are managed on the basis of a dismantling work plan. The existence of harmful matter must also be taken into account in dismantling work and when sorting construction waste. The plan shall describe the particular characteristics of the dismantling work, the work phases, as well as the methods and principles of making the work safe. The plan must cover sorting of the dismantling waste.

As a general rule, the disassembly of equipment into parts for scrapping is not allowed in power plants. The equipment to be scrapped must be immediately transported away from the power plants. For well-grounded reasons, disassembly of impellers or other pieces of equipment into parts for scrapping can be allowed at the power plants subject to a written permit given by Kemijoki Oy.

Work affecting load-bearing structures, such as power scraping or diamond drilling, must first be approved by Kemijoki Oy's construction works expert.

DIVING WORK

A written plan setting out a safety plan for the work site and for each work phase must be written before starting diving work. The person responsible for diving work and the person responsible for the running of the work will be required to sign a diving permission document before starting work and after the work is completed.



PROTECTION AGAINST HARMFUL EFFECTS WHEN WORKING

NOISE

Areas where the noise level exceeds 80 dB are marked and access to them is restricted. In addition to continuous noise, the work sites also have sources of noise transients, such as pneumatically-operated high-voltage switches. The harmful noise created by the work and by the working environment must be assessed in the respective work risk assessment.

If the noise or vibration spreading to the surrounding environment is to be particularly disturbing, the supplier must inform Kemijoki Oy and the municipal environmental permit authority in advance, and, if required, apply for a work permit.

CONFINED AND POORLY VENTILATED SPACES

The hydroelectric power plant environment has various confined and poorly ventilated spaces. The dangers present in them include hazardous substances, lack of oxygen, drowning, electrical shock or mechanical devices. The air quality is degraded by rusting, emissions caused by work methods and decomposition of biological materials. Interruptions of electrical and compressed air supply as well as rescue operations in accident situations must be prepared for in the work.

The following matters must be defined in the work risk assessment and in the safety plan:

Pressure gauges and oil tanks

- process isolation and prevention of accidental starts
- ventilation and measurement of air quality before and during work
- pneumatic and battery-operated or low-voltage and isolated tools
- need for a person outside the facility to secure the operation

Groundwater and central wells, cooling water pools and waterways

- process isolation and prevention of accidental starts
- need for cleaning the structures
- ventilation and measurement of air quality before and during work
- need for a person outside the facility to secure the operation

Inspection corridors for intake tubes and dam sluice gates

- ventilation and measurement of air quality before and during work
- need for a person outside the facility to secure the operation

Turbine cover and cover extension, spaces inside the generator and inner parts of flood gates

- process isolation and prevention of accidental starts
- pneumatic and battery-operated or low-voltage and isolated tools
- need for a person outside the facility to secure the operation



DUST

At project sites, the generation of dust is managed on the basis of a dust prevention plan. The plan presents the work phases involving the risk of creating dust, the means to prevent dust and its spreading as well as cleaning it away and treating it as waste.

ASBESTOS AND OTHER HARMFUL MATERIALS IN STRUCTURES

When planning and implementing work, the power plant-specific survey of harmful substances must be taken into account. In addition to harmful substances, the matters to be taken into account also include structures with moisture damage as well as harmful substances absorbed in soil and concrete structures. Work in a site containing harmful substances must be performed in a manner that produces minimal exposure. When planning the work, packaging, labelling and waste treatment of the dismantling waste must be taken into account.

HAZARDOUS SUBSTANCES

The personnel must be instructed and guided in the safe use of hazardous substances brought to the power plants and used for work there. The persons handling hazardous substances must also be prepared for handling possible leaks and treating the substances as waste. Any leaks shall always be treated as environmental deviations, and they must be immediately reported to Kemijoki Oy.

ENERGY EFFICIENCY, MATERIAL EFFICIENCY AND SORTING OF WASTE

Energy efficiency and material efficiency

Responsible use of energy and materials is an important element of corporate responsibility.

Efficient use of energy

- Rectify any compressed air leaks.
- Minimise the use of electrical heating.
- Switch off any unnecessary lighting.
- Stop any unnecessary pumps, fans and ventilation equipment.
- Investigate the possibility of using frequency converters.
- Make sure that correct settings are in use.
- Follow the preventive maintenance schedule.
- Execute equipment replacements and dimensioning tasks in an energy-efficient manner

Efficient use of materials and waste sorting

- Assess whether the product could be acquired as a service instead of purchasing it.
- Select materials which are
 - energy-efficient and generate few emissions
 - long-lasting and recyclable
- Take care of preventive maintenance and carry out repairs whenever possible.
- Sort waste materials in compliance with the instructions issued by the local waste management company.
 - utilise waste as material or energy as far as possible..
- For project sites, the sorting of waste is specified in the safety plan for the project..

ACTION IN EMERGENCIES

Before starting work: Establish the locations of emergency showers, fire alarm buttons, emergency exits and muster stations. Verify mobile phone coverage and the exact location details of the work site.

In an emergency: Call 112 and act as instructed. Report the emergency to the control room as well. Help is easier to obtain in an emergency if you have downloaded the 112 Suomi mobile application on your smartphone.

Accidents and even minor environmental deviations must be immediately reported to the party ordering the work.

CONTACT DETAILS

Kemijoki Oy
Valtakatu 11 / PL 8131
96101 ROVANIEMI
Switchboard: +358 20 703 4400

email: [firstname.lastname\(a\)kemijoki.fi](mailto:firstname.lastname(a)kemijoki.fi)

Control room of Kemijoki Oy's power plants:

Fortum's hydroelectric power operator / +358 10 454 8200 or +358 50 454 8200

Head of electrical operation: Jarkko Virtanen, 020 703 4485

Power plants: Raimo Ojala, +358 20 703 4464

Environmental matters: Erkki Huttula, +358 20 703 4431

Dam safety: Kari Pehkonen, 020 703 4450



WE ARE FINLAND'S BIGGEST PRODUCER OF HYDROELECTRIC AND REGULATING POWER

HYDROELECTRIC POWER is the most important form of renewable electrical power in Finland. With our 20 power plants, we produce approximately one-third of Finland's hydroelectric power.

DOMESTIC, RENEWABLE AND EMISSION-FREE hydroelectric power secures the availability of electricity and keeps Finland in operation and warm. Thanks to hydroelectric power, the need for fossil fuels is smaller, which reduces the carbon dioxide emissions and curbs climate change.

WE ALSO PROVIDE A STRONG SUPPLEMENT to other renewable forms of energy: to solar energy on cloudy days and to wind energy on calm days. In our operations, we take into account the environment and interact daily with people living by the rivers.

