

Vattenfall Services Nordic AB - SIKAM

Electrical Safety Instruction

Instruktion VS-IN-01067

Konfidentialitetsklass : C1 - Public

Utgåva nr 9, giltig fr.o.m. 2023-03-18

Abstract

According to work environment legislation the employer should ensure that all work is carried out in such a way that the necessary safety requirements for personnel are met.

With knowledge, engagement and constant improvements, it is our ambition to create a safety culture in which nobody is injured or becomes ill because of their work and where every employee takes an active role in preventing incidents and accidents

Together, we are creating Sweden's safest workplace.

Content

1	Introduction	4
1.1	Purpose	4
1.2	Scope	4
1.3	Target Groups	4
1.4	Definitions and abbreviations	4
2	Governance and clarification of responsibility.....	5
2.1	Application – Regulations, Instructions and Guidelines	5
2.2	Responsibility for Electricity.....	6
2.2.1	Electrical Facility Management – Electrical installations	6
2.2.2	Personal Safety Management when working with electrical hazards.....	6
2.2.2.1	Electrical Safety Planning.....	6
2.2.3	Installation Management.....	7
3	Electrical safety work.....	7
3.1	Electrical safety organisation ESA – Roles and responsibilities	7
3.1.1	Proprietor.....	7
3.1.2	Employer	7
3.1.3	Elsäkerhetsledare (nominated person in control of a work activity)	7
3.1.3.1	Responsibility for appointing Elsäkerhetsledare.....	8
3.1.3.2	Elsäkerhetsledares presence at the workplace.....	9
3.1.3.3	Instructed Elsäkerhetsledare.....	9
3.1.4	Electrical Coordinating Manager	9
3.1.5	Worker	9
3.1.6	Elanläggningsansvarig (person responsible for an electrical installation)	10
3.1.7	Eldriftledare (nominated person in control of an electrical installation during work activities)	10
3.1.7.1	Handing over Switching responsibility.....	10
3.1.8	Switching supervisor	10
3.1.9	Switching operator	10
3.2	Risk Management	10
3.3	Personal protective equipment – Requirements for the use of protective equipment.....	11
3.4	Training and skills.....	11
3.5	Reporting Incidents and Accidents	11
4	Checkpoint for internal follow-up.....	11
5	References	11
5.1	SIKAM-references	11
5.2	Other references	12
6	Revision History.....	12

Appendix:

- Appendix 1: VS-IN-00067-1 Directive Knowledge verification Elsäkerhetsledare
- Appendix 2: VS-IN-00067-2 ESA Utbildningsstruktur (no English version)
- Appendix 3: VS-IN-00067-3 Gränssnitt kunder som ej använder ESA (no English version)

1 Introduction

This instruction is a part of Vattenfall Services Nordic ABs management system, SIKAM.
 Document owner: Stadler Kent (GS-Q), approver of document: Svensson Dag (GS).

1.1 Purpose

To give frameworks and directives for how VSN:s safety work should be managed, with emphasis on electrical safety.

To ensure that all electrical work is carried out in such a way as to provide personal safety, responsibility and duties should be made clear and there should be set procedures within VSN’s organisation.

1.2 Scope

This instruction covers all electrical work carried out at an electrical installation, and/or on an electrical equipment, by or on behalf of Vattenfall Services Nordic, below named VSN.

1.3 Target Groups

Target group	Definition
Employees	Instinctively analyses any risks and take the necessary steps. If something is performed in a hazardous manner and my colleagues let me know, I appreciate it.
Project-/ Maintenance Manager	Analyze risks during work planning and perform Risk-P.
Manager	Responsible for safety at the workplace. Important tools are employees’ skills and attitude in combination with our way of managing risks.
SUB Contractor/Hired staff	Clear and safe because of VSN:s rules for the workplace.
Customer	Feels safe because VSN always have competent personnel who use experience feedback to minimize the risks.

1.4 Definitions and abbreviations

Expression / abbreviation	Definition
Electrical equipment	A device, apparatus or other object that produces, transfers, uses or consumes electricity, or a component of such equipment or of an electrical installation.
Electrical installation	An electrical facility for voltage, currents or frequencies which can be dangerous to people and/or property. In this instruction, electrical installation refers to electricity generation plants, electricity transfer plants and/or plants for consumption of electricity
Electrical work	Work on or close to an electrical installation, such as a switching, fuse replacement, testing and measuring,

Expression / abbreviation	Definition
	troubleshooting and repairs, replacement/changes/expansion, construction, maintenance, inspection.
Electrical hazard	Where there is risk of injury due to an electric shock or the effect of a short-circuit or electric arc.
Elsäkerhet - INFO	Information page for Electrical Safety within VSN:s internal website.
Proprietor	A physical or legal person who has the installation at his or her disposal, for example, through ownership, lease, rental agreement, contract or easement.
Skilled person	Has the competence, professional expertise and experience to be able to analyse risks and avoid potential hazards caused by electricity while working.
Qualified electrician	Person with sufficient knowledge and skills to carry out electrical installation work. Must be included in the list of Electricity Professionals according to VS-SP-00117 Self-audit scheme for electrical installation work.
Switching activities	Examples of switching activities are switching with breakers, disconnectors, creating or removing jumper, fuses or connecting piece etc.
Risk-P	Risk Management at planning. Carried out by the employer or by whoever this planning is delegated to.
Risk-U	Risk Management at performance. Performed at the workplace by Elsäkerhetsledaren (nominated person in control of a work activity).

2 Governance and clarification of responsibility

2.1 Application – Regulations, Instructions and Guidelines

ESA:

In order to meet the requirements of the Work Environment Act VSN has decided to adopt EBR electrical safety instructions, ESA.

Anyone who carries out electrical work must have access to and training in current edition of ESA.

In the case in which the proprietor has additional instructions, these should be adopted. These must not go against the minimum requirements stated in ESA, regulations and Swedish standards.

In the event that a purchaser does not work in accordance with the electrical safety instructions (ESA) in all respects, VSN will assist the purchaser in finding common solutions to ensure the work can be carried out in such a way as to provide personal safety. See appendix 3 “Gränssnitt kunder som ej använder ESA”.

Other applications:

In addition to ESA, regulations, standards, internal instructions/guidelines, method descriptions and customer applications should be enforced.

Where this instruction diverges from ESA then this instruction applies

2.2 Responsibility for Electricity

According to legislation there are different types of responsibility for electrical safety.

For VSN working on the electrical facilities of others, it is primarily responsibility for work posing electrical hazards (Personal Safety Management) and Installation Management that are relevant.

In order to be able to meet the respective areas of responsibility, the responsibility included in these duties must often be delegated.

2.2.1 Electrical Facility Management – Electrical installations

Responsibility for an electrical installation lies with its proprietor.

It is the responsibility of the proprietor of the facility to ensure that the facility is set up and in such a condition as to provide sufficient protection for people and property in its normal operation and use, as well as to supervise the facility in accordance with applicable regulations and Swedish standards.

The proprietor should provide the necessary information about the facility, its management and any risks (for example, plants with parallel lines with a risk of induction), to those working on the facility.

2.2.2 Personal Safety Management when working with electrical hazards

Responsibility for personal safety lies with the employer.

When work requires technical knowledge and experience to prevent electrical risks or damage, it must be carried out by someone who has the knowledge and experience or is supervised to a satisfactory degree.

The work should be carried out by a person with sufficient knowledge of the facility in which the work is to be carried out. The person should also have practical experience of this kind of work. It is therefore the responsibility of the employer to ensure that the person who carries out the work has the correct training and competence for the job.

Applicable regulations and directives should be available for the people participating in the work on or close to an electrical facility, in addition each person should be instructed on the content of these.

For work which entails an electrical hazard, the employer should appoint an Elsäkerhetsledare (nominated person in control of a work activity) for each job.

2.2.2.1 Electrical Safety Planning

For each job in which there is an electrical hazard there should be an electrical safety planning. The planning should include the appointment of the person(s) who must ensure that the required safety measures are taken.

At VSN this planning work is carried out by a person appointed by the employer by Risk Management at planning (Risk-P) and by the Elsäkerhetsledare (nominated person in control of a work activity) by Risk Management at performance for the workplace (Risk-U).

The electrical safety planning should include (not in order of priority);

- collating information about the facility and its position,
- identifying the workplace,
- ensuring the right competence is available for the implementation of the work,
- identifying sources of risk,
- eliminating the identified sources of risk,
- choosing the correct working methods,
- planning necessary operational measures,

- planning safety measures,
- informing everyone participating in the work about the safety measures and
- ensuring that everyone uses personal protective equipment.

The electrical safety planning should observe whether the facility's proprietor has issued any instructions to prevent injuries caused by electricity.

The planning can be adapted to the scope of the work and the necessary safety measures.

2.2.3 Installation Management

At VSN, installation management and installation work are regulated in the manual VS-SP-00117 Self-audit scheme for electrical installation works.

3 Electrical safety work

The basis for a safe working method is to always have full focus on the task and its potential risks. An important part is risk management and choice of working methods/protective equipment, however, of equal importance is to not allow, for example, cell phones to create distractions that deteriorate focus on the task, at critical moments.

See VS-IN-00123 for more information about use of cell phone during performance of work.

It is both management as well as performers responsibility to have knowledge about possible risks and measures needed to be taken during work.

3.1 Electrical safety organisation ESA – Roles and responsibilities

3.1.1 Proprietor

See 2.2.1 Electrical Facility Management – Electrical installations in this instruction.

3.1.2 Employer

The employer is the person who, within VSN, leads operations. Manager, Project Manager, Maintenance Manager, etc

The employer shall ensure that operations are run in such a way that nobody is injured at work by, for example.

- ensuring that all work or measures which are carried out should be done in such a way that the necessary safety precautions are always met for the employee. Time pressures and/or extended working shifts should not affect personal safety,
- for each job with electrical hazard, appointing an Elsäkerhetsledare (nominated person in control of a work activity) with the skills which are needed to lead the work and with the authority to take any measures that may be required,
- ensure that current laws, rules and instructions are followed.

3.1.3 Elsäkerhetsledare (nominated person in control of a work activity)

Elsäkerhetsledare should be appointed for all types of electrical work.

Elsäkerhetsledare shall have documented ESA training, knowledge of the tasks that are fundamental to the role of Elsäkerhetsledare, practical experience, knowledge of the facility and the authority and resources, required to manage electrical safety work at the workplace.

Those who shall act as Elsäkerhetsledare of more than one person shall undergo a knowledge verification according to Appendix 1 "Directive Knowledge verification Elsäkerhetsledare" and have it documented in written in role description VS-SP-00186.



In addition to the above requirements, those without previous experience of acting as Elsäkerhetsledare shall have had an individually tailored number of occasions managing Elsäkerhetsledares tasks under the oversight of an experienced Elsäkerhetsledare. After this, dialogue takes place between the experienced Elsäkerhetsledare and the employer to establish if they can act independently as an Elsäkerhetsledare or if further occasions working under oversight are required.

The basis for a safe work environment is to carry out documented risk management, Risk-U, and Elsäkerhetsledare should, in addition to the responsibility assigned by ESA, also take responsibility for carrying out the points below (in no order):

- Take part of Risk-P for the work and inform in work involved personnel about the content and planned measures and use it as a basis for own performed Risk-U
- After review och Risk-U together with involved personnel, the names of the respective co-worker are noted within the risk management,
- If anyone does not follow the applicable regulations or the safety measures taken, e.g. by not using personal protective equipment, the Elsäkerhetsledare should remove the person from the workplace and inform their line manager. A request means that the person must immediately leave the workplace.
- Be able to act as Switching supervisor
- Be able to act as Qualified electrician according to VS-SP-00117 Self-audit scheme for electrical installation work and check that the facility is left in a condition in accordance with regulations.
- In situations where work not can be perform in a safe way Elsäkerhetsledare shall pause the work and a new electrical safety planning shall be performed.

3.1.3.1 Responsibility for appointing Elsäkerhetsledare

It is the employer who is responsible for appointing Elsäkerhetsledare. Training, competency and experience of the facility, work method and equipment should be considered. See 3.1.3 and appendix 1.

Elsäkerhetsledare in electrical works should be a Skilled Person, according to ESA, and, depending on the nature of the work, be a Qualified Electrician who meets the competency requirements according to VS-SP-00117 Self-audit scheme for electrical installation work.

Individuals and employers have a shared responsibility to assess the individual's competence as Elsäkerhetsledare. However, the individual is always responsible for self-assessing their competency to be Elsäkerhetsledare for the actual tasks and, in the event of risks arising, stopping and making a new assessment. If a person does not consider themselves capable of being an Elsäkerhetsledare, it is important to share this immediately.

In accordance with the above, the Qualified Electrician has been deemed appropriate for the role of Elsäkerhetsledare for the work in all tasks within his/her business area.

In VSN, Elsäkerhetsledare are appointed based on the following principles:

1. Directly appointed through work management. (Operating order, job description, appropriation at a permanent place of work, scheduling within geographical contingency areas or the equivalent.)
2. For all types of work where the executor performs the work alone or together with those who are not professionally skilled, the executor is always the Elsäkerhetsledare for the actual work.
3. In the case of work beginning "by one's own initiative", the executor is always the Elsäkerhetsledare for the actual work.
4. In circumstances where the Elsäkerhetsledare is not clearly designated or needs to be changed in the workplace, and dialogue with the employer is not possible, employee numbers shall be used to rank who is to be assigned the responsibility. The lowest number takes on the responsibility of being Elsäkerhetsledare. Individuals without employee numbers (i.e. subcontractors) are ranked as subordinates to individuals with employee numbers.

Before work begins, Elsäkerhetsledare shall carry out a risk management (Risk-U) where, among other things, the assignment of Elsäkerhetsledare and those included in the work team are clarified. Within the framework for Risk-U, the appointed Elsäkerhetsledare considers if, for any reason, it is appropriate to replace the Elsäkerhetsledare on the premises.

In a situation where Elsäkerhetsledare must leave the workplace, the work shall halt until it is clarified who shall be Elsäkerhetsledare in the workplace going forward.

If circumstances require, Elsäkerhetsledare shall notify the employer about the need to appoint a different/additional Elsäkerhetsledare. When a Permit-to-work has been provided, it must be communicated to the Eldriftledare (nominated person in control of an electrical installation during work activities) and the Permit-to-work returned. A new/additional Elsäkerhetsledare must take out the necessary Permit-to-work before the work continues. All staff affected should be notified of changes such as those named above. A new risk management (Risk-U) shall be produced based on different conditions, and the identity of the Elsäkerhetsledare should be clarified therein.

If a situation should arise where more than one Elsäkerhetsledare, for the same work, are simultaneously at the same workplace, e.g. helping with a fault, the following order will dictate who should take on the role of Elsäkerhetsledare. A new risk management (Risk-U) shall be produced based on different conditions, and the identity of the Elsäkerhetsledare should be clarified therein.

1. Work that has been started in the workplace,
2. On the contingency list for the area, within which the work is being carried out (local knowledge),
3. According to the principle of the lowest employee number.

3.1.3.2 Elsäkerhetsledares presence at the workplace

Elsäkerhetsledare should, under the duration of the work, be on site or close to the workplace in order to be able to ensure that the electrical safety work is being carried out in accordance with planning performed, risk management and other applicable regulations.

In a situation where an Elsäkerhetsledare must leave the workplace, the work shall halt until it is clarified who shall be the Elsäkerhetsledare in the workplace going forward.

3.1.3.3 Instructed Elsäkerhetsledare

Instructed Elsäkerhetsledare is defined in ESA in two levels. Instructed Elsäkerhetsledare - non-electrical work and Instructed Elsäkerhetsledare - clearing of powerlines.

In the case of non-electrical work where there may be an electrical risk or in the event of clearing of powerline when there is no Skilled Elsäkerhetsledare, Instructed Elsäkerhetsledare must be appointed. Instructed Elsäkerhetsledare must be instructed for the specific work by a skilled person. The form "ESA Överenskommelse om tillträde" is used as a basis and must be signed by those concerned after review.

3.1.4 Electrical Coordinating Manager

When working in multiple workplaces, employers can appoint an Electrical Coordinating Manager to coordinate the electrical safety work and Elsäkerhetsledare, as found in every workplace.

Electrical Coordination Manager shall have sufficient competence, similar to skilled Elsäkerhetsledare level T4, and have knowledge of the tasks that are fundamental for the work.

When the work is large enough to need the appointment of an Electrical Coordinating Manager, it should be regulated in writing in the form of a local instruction issued by the employer together with the Elanläggningsansvarig (person responsible for an electrical installation).

3.1.5 Worker

A person who, regardless of position, carries out the work under the supervision of Elsäkerhetsledare. It is the individual employee's responsibility to inform the Elsäkerhetsledare and their line manager if the actual work is not covered by his specific training and level of competence.

The worker should, in addition to the responsibility assigned by ESA, also take responsibility for the points below (in no particular order);

- be equipped with and always use appropriate personal protective equipment as well as maintain equipment and tools so that they are intact, clean and without visible faults,
- together with the Elsäkerhetsledare, go through the drafted risk management, Risk-U, and ensure that he/she has understood the meaning and that their name is noted within the risk management.

3.1.6 Elanläggningsansvarig (person responsible for an electrical installation)

Person who has been given responsibility by the proprietor for ensuring the safe management of an electrical facility (operation and maintenance).

Application in cases where VSN has agreed to an Elanläggningsansvarig via agreement.

- The assignments of the Elanläggningsansvarig should be regulated through agreements between the proprietor and VSN. The applicable conditions, duties and authority included within the contracted Electrical Facility Management – Electrical installations, shall be clearly stated within the agreement.
- Work planning and work within the facility shall always be carried out in accordance with the ESA

Delegation of Elanläggningsansvar should be documented.

Use template: *VS-MA-00032 Delegering Elanläggningsansvar.*

3.1.7 Eldriftledare (nominated person in control of an electrical installation during work activities)

Person who, based on instruction, plans and takes responsibility for switching within Elanläggningsansvarig stated area.

Delegation shall be documented.

Use template: *VS-MA-00035 Delegering Eldriftledare*

or

VS-MA-00159 Delegering Eldriftledare – Extern Elanläggningsansvarig

3.1.7.1 Handing over Switching responsibility

Eldriftledare can hand over switching responsibility. This is done in written and should be clearly defined.

3.1.8 Switching supervisor

A prerequisite for being Switching supervisor is a good knowledge of the actual switching areas as well as access to documentation, grid maps, operating schedules etc.

3.1.9 Switching operator

The Switching operator shall, among other things;

- check and confirm the operational order for the specific sections,
- carry out Risk Management before operation.

3.2 Risk Management

Risk management is a continual process, which should be carried out both in the planning phase (Risk-P) and the implementation phase (Risk-U) and be continually ongoing until the work is completed.

See VS-IN-00013 Riskhantering inom Kvalitet Arbetsmiljö Miljö och Säkerhet.

Risk management, Risk-P, should always be carried out in written to form the basis of the choice of working method, and communicated to Elsäkerhetsledaren for the job.

Design and preparation are also included in the concept *Planning*.

Risk management, Risk-U, should always be carried out in written before each individual job and, in the event of changes to the conditions, new risk management will be required.

If the conditions change, it can mean that Risk Management is carried out several times in the same working day.

Involved parties should actively go through the drafted risk management to ensure everyone has taken part in and understood the significance. After review of Risk-U, the names of the respective employees are noted within the risk management.

3.3 Personal protective equipment – Requirements for the use of protective equipment

To minimise the risk for personal injury, it is necessary for everyone who is present in our workplaces to wear, in relation to the risk level, suitable protective equipment.

See VS-IN-00031 Personal protective equipment.

Comment:

In this instruction *workplace* refers to; workplace where VSN has responsibility for Risk Management and under its own management or under customers' or owners' requests carries out the work and have the coordination responsibility.

3.4 Training and skills

ESA Training:

All staff who carry out electrical work should have taken relevant ESA-training according to appendix 2 “ESA Utbildningsstruktur” with approved result.

Personnel who have not passed the ESA training are not permitted to carry out electrical work.

VS-IN-01067 Electrical Safety Instruction

All personnel carrying out electrical work should have a good knowledge base of the contents of this instruction, preferably read in conjunction with the above ESA training. Once the instruction has been revised, each person must, on their own, check for updates.

3.5 Reporting Incidents and Accidents

Reporting and analysing accidents and incidents is an important facet of continuous learning for improving electrical safety, and all should, thus, be reported within VSN's system for deviation management.

See VS-IN-00036 Measures for occupational accidents and serious incidents.

4 Checkpoint for internal follow-up

If this instruction is incorrect or is not complied with, the issue is dealt with according to Deviation management VS-IN-00017.

5 References

5.1 SIKAM-references

Document-ID	Title
VS-PO-00001	Operational policy for Vattenfall Services Nordic AB
VS-IN-00004	Legislation and other requirements
VS-IN-00009	Requirements for contractors and consultants

Document-ID	Title
VS-IN-00013	Risk management and planning in Quality, Work Environment, Environment
VS-IN-00017	Deviation management
VS-IN-00031	Personal protective equipment
VS-IN-00036	Measures for occupational accidents and serious incidents
VS-IN-00123	Use of mobile phone during execution of work
VS-SP-00117	Self-inspection programme for Electrical Installation Works

5.2 Other references

Document/resource	Description
ESA	Electrical safety instructions
SS-EN 50110-1	Management of electrical facilities
SAM	Regulations and general advice on work safety

6 Revision History

Issue nr	Changes	Approved by
9 Valid fr.o.m. 2023-03-20	<p>Appendix 1 and 2 added</p> <p>Text changed, updated and adjusted in document for better understanding</p> <p>Volume of text reduced by removing text that are repeated from other documents such as ESA and other internal instructions</p> <p>Section 3.1.3: Bullet points added. "In situations where work not can be perform in a safe way Elsäkerhetsledare shall pause the work and a new electrical safety planning shall be performed"</p> <p>Section 3.1.4: Text added "Electrical Coordination Manager shall have sufficient competence, similar to skilled Elsäkerhetsledare level T4, and have knowledge of the tasks that are fundamental for the work"</p> <p>Section 5:2: Reference to regulations adjusted</p>	Dag Svensson
8 Valid from 2021-03-15	<p>New format and several editorial changes.</p> <p>Section 3: Reference to VS-IN-00123 mobiltelefonanvändande added</p> <p>Section 3.1.3: Some text that is repetitive from ESA has been removed. Among other things, tasks for Elsäkerhetsledare</p>	Dag Svensson

Issue nr	Changes	Approved by
	<p>Requirements for knowledge verification to act Elsäkerhetsledare for more than one person added</p> <p>Text regarding Elsäkerhetsledare to take part in Risk-P added</p> <p>Section 3.1.3.3: Added new section regarding Instructed Elsäkerhetsledare</p> <p>Section 3.2: Adjusted terms to comply with instruction VS-IN-00013 and added text regarding Risk-P</p> <p>Section 3.3.1: Included text with visor or protective goggles</p> <p>Section 3.4. Included with requirements ESA Instructed person - Non-electrical work</p> <p>Appendix 1 added</p>	