

Approved by (department acronym, name)
QF Dick Eriksson
 Issued by (department acronym name phone)
Mats Blomberg 070-288 48 94

Working with high voltage



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Practices in high voltage

All work with high voltage, over 1kV, shall normally be preceded by Request for Permit to Work (arbetsbegäran), Operating Order (driftorder) or any kind of evidence and even a Switching Schedule (kopplingsedel). Permit to Work (arbetsbevis) shows that safety measures, disconnecting and blocking, are performed. Certificate of Commissioning (driftsbevis) indicates that the object is ready for commissioning.

Work may not commence before all safety checks are carried out including using the use of Permit to Work. Arming shall not occur before Switching Supervisor received Certificate of Commissioning.

Role descriptions

Description of the different roles in the work with high voltage, please note that a person can have several different roles.

Electrical Operation Supervisor / nominated person in control of an electrical installation

- Person who is appointed by the facility owner and responsible for maintenance and operation of electrical installations, the responsibility can be delegated in selected parts.

Switching Supervisor

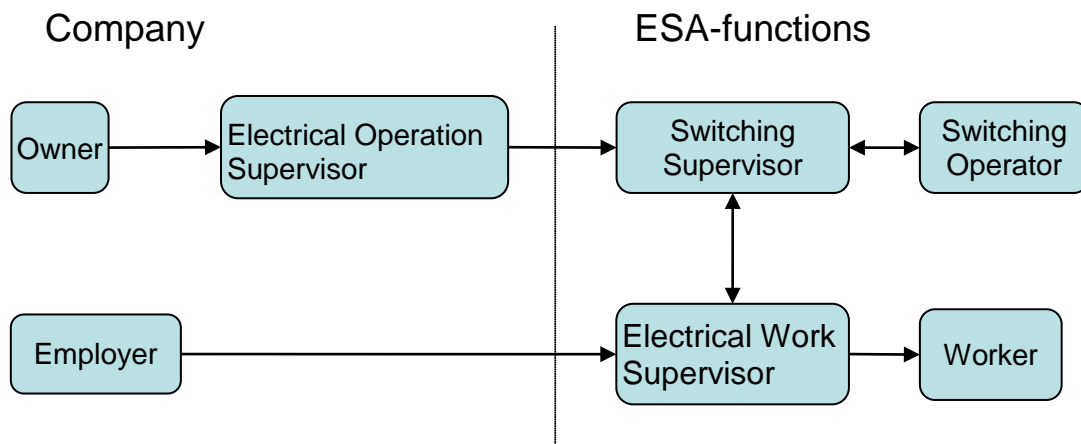
- Person responsible for planning and couplings within the area specified by the electrical operation supervisor, see 179-ELS-0030

Switching Operator

- Person on the order from Switching Supervisor performs connection work. Can be the same person as Electrical Work Supervisor.

Electrical Work Supervisor / nominated person in control of a work activity

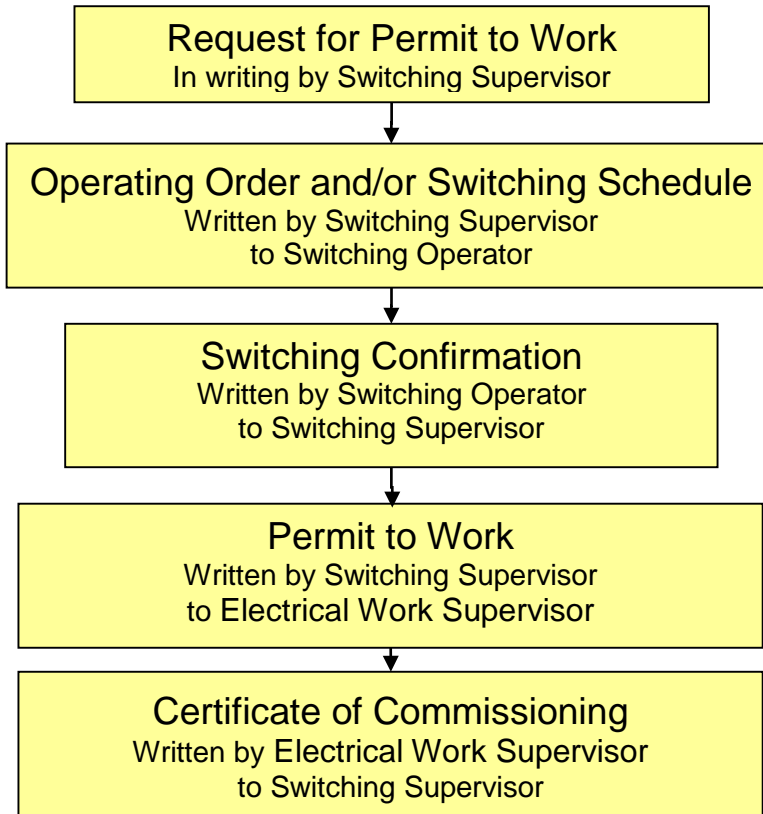
- Person whom been delegated the work task by the employer to be responsible for the performance of electrical work.





Planning for work on high voltage

Work process and document's



Request for Permit to Work - Electrical

Request for Permit to Work shall be made in writing by Switching Supervisor and in advance of the planned work. In a low voltage installation, below 1kV, determines Switching Supervisor if and when a written Request for Permit to Work is needed.

Written Request for Permit to Work must include at least:

- the plant parts affected
- name and telephone number of client
- the current account to be charged
- site boundaries with sketch
- scope of work, place of certificate shifting
- changes after work is performed
- risk assessment methodology

Operating Order -Electrical

Written by Switching Supervisor to Switching Operator.

Overriding document issued when the couplings involving more than one Switching Supervisor and/or Electrical Work Supervisor, as well as the directive, if any issued by Electrical Operation Supervisor. We may be concerned by switching orders from owners of the superior electrical supply system.

The measures shall be performed in the order listed on the Operating Order.

Before

an operation is issued, it shall be verified and signed by another person with the appropriate skills.

Operating Order must include information about:

- issuers
- who should be notified
- who controlled the operational order
- name on Switching Supervisor
- scope
- date and time of performance
- Electrical Work Supervisor
- conditions that apply before the switching work and the actions to be taken for the work

Switching Schedule -Electrical

When we ourselves shall operate in our power supply system, we have to write a Switching Schedule. The Switching Schedules shall be written by Switching Supervisor to Switching Operator.

At malfunctions or operational shifts it is important to use a written form. This is transmitted preferably by teleferm or fax (no SMS when you can't guarantee that all information has reached the receiver). On these occasions can Switching Schedule consists of written instructions drawn up in advance.

A Switching Schedule must have a unique designation to preclude confusion.

The Switching Schedule should be approved by another skilled person before the work begins.

A Switching Schedule must include information about:

- who created the Switching Schedule
- what plant parts with boundaries that work / break cover
- numbered actions with normally one action for each point



Switching Confirmation -Electrical

Anyone who has performed a coupling must write a Switching Confirmation, the confirmation shall be written by Switching Operator to Switching Supervisor.

According to the definition the switching confirmation is a receipt that ordered actions have been executed, or that the facility has special coupling positions.

A Switching Confirmation shall be provided when:

- disconnecter is blocked
- railway circuit breaker blocked in a disconnected position
- fuses and circuit breaker, over 160 A, removed and blocked
- jumper/slack removed for work and fixated
- earth device attached
- bus bar has been disconnected

Written confirmation of the coupling means couplings mode is maintained until confirmation is repealed. Termination of a written Switching Confirmation is made by written note, or order of a new coupling.

Permit to Work -Electrical

Permit to Work are confirmation that the safety measures taken for work in the electrical plant section that the evidence indicates.

The evidence implies that the measures will continue until the Certificate of Commissioning submitted by the holder of the permission. Permit to Work must be in writing and signed by Switching Supervisor for Electrical Work Supervisor.

Permit to Work must include information about:

- issuers
- recipients
- the plant parts with boundaries that the work covers
- any measures against dangerous induction from parallel lines /cables
- possible attached work earthing devices

Certificate of Commissioning

If there are Permit to Work, must the Certificate of Commissioning be submitted by the holder of the Permit to Work. The Certificate of Commissioning is a confirmation that an installation part is ready for operation with the changes that the evidence specify.

Certificate of Commissioning must include information about:

- who provided the evidence
- the plant sections that the Certificate of Commissioning refers to
- any changes to the facility and its coupling modes
- any changes of solid state relays, control systems and measuring equipment





Vocabulary and terminology

To avoid misunderstandings, use the following vocabulary in high voltage work.

Position indication

Object	Position indication		Order expression	
Circuit-breaker Switch Contactor Disconnecting circuit-breaker	On	Off	Close	Open
	1	0		
Disconnecter Switch-disconnector Fuse-switch-disconnector Fuse-disconnector Safety switch Earthing switch	Closed	Open	Close	Open
	1	0		
Disconnection with withdraw able unit	Closed	Open	Close	Open
	operating position	Disconnected position	Set to operating position	Set to disconnected position
	1	0		

Operation state

Object	Operation state		Order expression	
Earth Circuit connector	Attached	Removed	Attach	Remove
Fuse Connecting piece Jumper/Slack	Attached	Removed	Attach	Remove
Relay protection Automatic system	Operating	Not operating	Take into operation	Take out of operation
Part of an installation	Connected	Disconnected	Connect	Disconnect
Blocking	Blocked	Not blocked	Block	Remove blocking

