

Section 10: Operating and Maintenance of SWER

*Special considerations compared to
conventional systems.*

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Key considerations for discussion.

- Understanding SWER concepts - field operators and servicemen.
- Consequences of incorrect
 - Protection replacement.
 - Line hardware and equipment installation/replacement.
- Operating regulations - Operating procedures and Working earths.
- Lines on same structure.
- Feedback from field operators.

Break 1

Operations and Maintenance: *Field staff knowledge.*

Enlighten to the fundamental concepts of technology and difference in focus when compared to conventional MV – particularly SWER earthing and protection.

- Maximum fuse size labels - By pass structures.
- Capacity of SWER schemes – normally relatively low
 - Unrealistic expectations for reclosers to be installed.

Operations and Maintenance: *Consequences of incorrect application.*

Problems encountered -

- Paralleling protection devices
- Replacing by pass fuses with solid links.

Consequences of incorrect **protection** replacement.

- No protection for the system.
 - Death or injury to public.
 - Damage to equipment.
 - Prosecution.
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- Exacerbated by incorrect line hardware installation.

Operations and Maintenance: *Incorrect application.*

Experience of incorrect **line hardware** and equipment installation/replacement.

Post top bracket installation.

- Incorrect material
- Holes too big
- Ultimate failure of equipment with possible damage injury risk.

Wire form products incorrect size installed.

(Relates to extra strong conductors of similar cross section).

- Conductor pulls out of pre - form
- Damage to other components - recloser/transformer bushings.

Operations and Maintenance: *Incorrect application.*

Incorrect **line hardware** and equipment installation/replacement.

- Incorrect stringing and tensioning.
- Wind induced vibration – related to line tensions and extra strong conductor usage.
- Additional strain on all components.
- Conductor pulls out of pre – form.
- Damage to other components - recloser/transformer bushings.

Operations and Maintenance: *Incorrect application.*

- Replacement - transformer installations.
 - Incorrect earthing.
 - Incorrect tap selection and damage to tap switches (32 kVA transformers).
 - Earth lead connections/redundancy.

Break 2

Operations and Maintenance: *HV regulations - Operating procedures and Working earths.*

HV regulations - Operating procedures and Working earths:

Same operating regulations as for conventional systems.

- Review needed –
- Regulations to take cognizance of earthing requirements - where local working earth is poor - could have dangerous consequences.
- Specific earth electrodes at switching, control earthing point to be introduced.

Operations and Maintenance: *Lines on the same structure.*

Lines on same structure

- Specific requirements for labelling - individual circuits to be labelled.
- Shared circuits are to have ganged switch control, - where shared both to be “off or on”.
- Where single circuits depart main circuit, a switch is required.
- Protection rating and application of downstream devices are such as to ensure safe operations.

Break 3

Operations and Maintenance: *Feedback from operators and incidents.*

Feedback from field operators.

- No major faults encountered in recent time - both contractor and utility operators response.
- Problems have been encountered with: -
 - Incorrect pre forms and pre form failures.
 - Lightning damage to poles.
 - In cases discussed, protection (SWER) and in some cases primary protection operated.
- In all cases field response has been positive regarding ease of operation.