Contact line: Design. Feeder line, reinforcing feeder and bridging feeder

1 Purpose and scope

The purpose of this document is to ensure that the design of the feeder line, reinforcing feeder and bridging feeder complies with the requirements of the NNRA. The requirements in this document must be observed when new overhead contact line systems are designed and when extensions and modifications are designed for existing systems.

[FEF] applies to those areas for which design requirements have not been specified in this chapter.

2 Feeder line

2.1 Design

The design dimensions of the feeder line must be based on 15 kV nominal voltage and 16 ⅔ Hz.

The cross-section of the feeder line is determined by the transmission capacity of the overhead contact line system.

The feeder line must normally be in the form of an uninsulated single-conductor line.

The feeder line must have the same insulation level as the overhead contact line system; refer to Felles elektro/Prosjektering og bygging/Isolasjonskoordinering og overspenningsbeskyttelse Høyspenningsanlegg.

There must be a minimum distance of 2.0 m between the live part of the overhead contact line system and the feeder line.

2.2 Suspending and laying

The feeder line must not be suspended across loading terminals, loading tracks or platforms.

The feeder line may be laid as a cable in situations where this is practical.

The feeder line may be suspended from the row of masts used by the overhead contact line system.

- If the feeder line and return-current conductor/lineside earthing conductor are suspended from the same row of masts:

  Insulating mountings must be connected to lineside earthing conductor/return-current conductor connected to the rails at maximum intervals of 1 km. These connections must be coordinated with the signalling system.

- Feeder line without earthing conductor/return-current conductor on the same row of masts:

  If the row of masts is close to the rails, the insulating mountings must be earthed directly to the rails or the common earth.
  If the row of masts is not close to the rails, separate earth electrodes must be used.

Return cables from the rails and feeder cable must be laid in pairs in the same cable duct.

2.3 Connection

The feeder line must be connected both to the contact wire and the messenger wire.

Refer also to Banestrømforsyning/Prosjektering/Mate- og returkabel#Tilkobling av matekabel til kontaktledningsanlegget.

3 Reinforcing feeder

3.1 Design

The design dimensions of the reinforcing feeder must be based on 15 kV nominal voltage and 16 ⅔ Hz.

The design dimensions of the reinforcing feeder's cross-section are to comply with the maximum anticipated level of transmission power.

The reinforcing feeder must have the same insulation level as the overhead contact line system; refer to Felles elektro/Prosjektering og bygging/Isolasjonskoordinering og overspenningsbeskyttelse Høyspenningsanlegg.

The reinforcing feeder is normally in the form of an uninsulated single-conductor line.

3.2 Suspending, laying and connecting

The reinforcing feeder must not be suspended across loading terminals, loading tracks or platforms.

The reinforcing feeder must be attached to insulators on masts and portal structures.

When bilateral feeding is used, the reinforcing feeder must normally be constructed out from each feeder point to one third of the distance between the feeder points.

The feeder may be suspended from the row of masts used by the overhead contact line system. The feeder's branches must be connected both to the contact wire and the messenger wire.

Reinforced suspension equipment must be used in areas trafficked by people. This will normally be in areas such as stations and level crossings.

The reinforcing feeder may be laid as a high-voltage cable in situations where this is practical.

- If the reinforcing feeder and return-current conductor/lineside earthing conductor are suspended from the same row of masts:

  Insulating mountings must be connected to lineside earthing conductor/return-current conductor connected to the rails at maximum intervals of 1 km, coordinated with the signalling system.

- Feeder line without earthing conductor/return-current conductor:

  If the row of masts is close to the rails, the insulating mountings must be earthed directly to the rails or to the common earth.
  If the row of masts is not close to the rails, separate earth electrodes must be used.

4 Bridging feeder

4.1 Bridging feeder at stations

The bridging feeder takes current across a station or major track layout, ensuring that the normal feed situation can be maintained if there is a local power failure at the station. The bridging feeder normally connects the cable network on open lines in series, and acts as a 'bridge' across the station

area.

Bridging feeders should be used at all stations.

4.2 Design and implementation

The bridging feeder is normally in the form of an uninsulated single-conductor line and is attached to insulators on masts and portal structures. The feeder may be suspended from the row of masts used by the overhead contact line system or from a separate row of masts. The feeder's branches must be connected both to the contact wire and the messenger wire.

The feeder's cross-section must be compatible with the transmission capacity of the overhead contact line system.

The bridging feeder must not be suspended across loading terminals, loading tracks or platforms.

Reinforced suspension equipment must be used in areas trafficked by people. This will normally be in areas such as stations and level crossings, and when the cables run parallel to roads.

The bridging feeder may be laid as a high-voltage cable in situations where this is practical.

5 Autotransformer system

The design of the autotransformer cables must as specified in kapittel 9 (Autotransformatorsystem med seksjonert kontaktledning).