The Follo Line Project
New double track for 250 km/h from Oslo S to Ski

Supplier Meeting 1 February 2018

Tore Myhrvold
Manager Railway Systems, TBM Tunnel

The Follo Line project
Facts and Scope

- New double-track railway between Oslo Central Station and the public transport centre Ski.
- The Follo Line project will comprise around 64 km of tracks.
- Extensive works at Oslo Central Station with a new concrete tunnel in the area where Oslo was founded 1000 years ago.
- Construction of a new station at Ski with 3 new long platforms, 6 tracks and underpass for passenger comfort.
- The longest railway tunnel in Norway ~ 22 km.
- Two separate tunnels, excavated by 4 TBMs (2016-Q4 to 2019-Q1), net R=4.375 m, with cross-passage every 500 m, for electrical installations and emergency escape route.
- Tunnel is designed for 250 km/h and can be used for future high speed railway Oslo-Gothenburg.

The Follo Line is scheduled for commissioning December 2021

- Project is split in three sub-projects for all Railway Systems excl. Signalling and Telecom.

  EPC Contracts (turn key) based on NTK-07 in English language:

- Oslo S: Awarded Mar 2017, will be completed in **August 2021**
  - Contractor Infranord Norge AS
- TBM Tunnel: Awarded in March 2015, will be completed in **April 2021**
  - Contractor: Acciona Ghella Joint Venture, Spain/Italy.
- Ski: Awarded in August 2015, will be completed in **August 2020**
  - Contractor: Obrascon Huarte Lain (OHL), Spain.

- Engineering of Railway Systems is ongoing, purchase has started, but the majority of equipment contracts are not yet awarded.

- Subcontractors for Railway Systems construction are signed.

Visit: www.banenor.no/Prosjekter/follobanen/

Traction Power Supply, 16.7 Hz (Autotransformer system for power supply to Overhead Contact Line)

- 36 kV Cables and Bare Conductors, Al 400, total ~ 150 km
- 30/15 kV Autotransformers, total rating 120 MVA, in 5 and 10 MVA units.
- 36 kV Switchgear, GIS, in three locations, total of 8 units.
- Extension of 16 2/3 Hz power supply (50 to 16 2/3 Hz converter station) is not part of the scope. However, some preparations for a new Oslo Converter station (Åsland) will be made.
- Delivery of equipment in 2019 and 2020.
- Construction in 2020.

Overhead Contact Line, 15 kV System25 and System20

- Oslo S: S20 in concrete tunnels from Oslo S platform area to rock tunnel in Ekebergåsen Hill. Total OCL distance ~10 km.

  Construction in 2019, 2020 and 2021.

- Tunnel: S25 in 52 sqm. TBM tunnel, for 250 km/h, 2 x 20 km

  Construction in 2020.

- Ski: S20 for 200 km/h, with 35 turnouts, total OCL distance ~17km. H beam poles and steel gantry portals.

  Construction in 2018 and 2019.

Infrastructure Power Supply, 50 Hz, 22 kV and 400 V, for power supply to 400 V loads along railway infrastructure

- 24 kV Cables, twin bundle, 3 x 1 x 150 Al, total ~ 40 km
- 400 V Cables, various cross-sections, total ~ 200 km
- 22/0.4 kV transformers, rating 50, 200 and 500 kVA, total ~ 60 units
- 24 kV Switchgear, GIS, total ~ 100 units
- 400 V Switchboards, total ~ 80 units
- 400 V UPS, (AC/DC, Batteries, DC/AC) total ~ 50 units
- Delivery and installation of equipment in 2018, 2019 and 2020.

400 V Infrastructure Loads, 50 Hz, along railway infrastructure

- 400 V Cables, various cross-sections, total ~ 200 km
- Turnout heating system, 65 turnouts, ~ 25 kW per unit
- Ventilators (Jet Fans), ~ 33 kVA, total ~ 60 units
- Emergency Illumination, LED in handrail, 30-1 Lux, total ~ 50 km
- Illumination, passenger areas, technical rooms, cross passages, escape tunnels
- Delivery and installation of equipment in 2018, 2019 and 2020.