Vamma 12 Hydropower Project
Norway

Presented by: Øyvind Engelstad
Glomma and Lågen river catchment:
- 620 km from source to sea
- 42 000 km²

The largest river in Norway

Vamma HPP
Vamma Hydropower Station – 1st turbine commissioned in 1915 – “still going strong”
Salient Features Vamma 12

- Head: 29 m
- Turbine discharge: 500 m$^3$/s
- Installed capacity: 128 MW
- Energy production: 1000 GWh
- Headrace cross section: 250 m$^2$
- Power house shaft: 60 000 m$^3$
- Tailrace cross section: 300 m$^2$
- CAPEX: 110 MEUR

Stakeholders

- Owner: E-Co
- Contractor: AF
- Engineer: Norconsult
- Supplier Elmech: Voith
- Supplier Gates: Andritz
VIRTUAL DESIGN AND CONSTRUCTION APPROACH

- **Fully integrated BIM** (building information model) without production of 2D drawings.
- The “digital twin” (BIM) as basis for all processes.
- All construction and operation critical **meta data** integrated in the model.
- Geometry and data from BIM transferred into **construction equipment** (jumbo etc.).
- **Data collected** from construction equipment **shared in the BIM** for design optimization and documentation (geometry, geology etc.)
Chuzhou-Nanjing 7th November 2018  Øyvind Engelstad SVP Head of Construction
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Øyvind Engelstad SVP Head of Construction
15-20 m overburden
100 m\(^2\) face excavation
5 m round length
1300 kg Bulk emulsion explosives
VIBRATION LIMIT: \(V_f < 10 \text{ mm/s}\)
SOLUTION: Electronic Blasting System (from Orica)
RESULT: low vibrations, good contour and less blasting induced damage to the rock mass
TECHNOLOGY AND METHODOLOGY TAKE YOU FURTHER, BUT AT THE END COOPERATION IS THE MOST IMPORTANT FACTOR TO SUCCEED