

Building Information Modelling (BIM) in Hydropower Projects

Building Information Modelling (BIM) and Virtual Design and Construction (VDC) are the fundamentals of model-based design, which helps improve collaboration, control, and assurance of project delivery in the hydropower industry.

Why BIM? Hydropower projects involve many stakeholders and engineering disciplines where collaboration and coordination are key drivers for successful project implementation. Digital technologies have the definite potential to support and improve hydropower projects throughout the entire project life cycle, from study phase to implementation and further to operation and maintenance.

Digital solutions help increase speed and quality by empowering project teams with real-time project information, a collaborative work flow and a bulletproof audit trail. Digital technologies are critical for making projects successful and profitable.

Clear advantages

- **Ultimate collaboration:** Model-based design enhances efficient information sharing between all stakeholders through the entire project life cycle.
- **Minimizing project risks:** Reviewing of 3D models leads to transparency and early identification of potential conflicts and reduces project risks in terms of costs and time.
- **Better communication:** Visualization and simulation of critical issues supports communication and leads to better decisions.
- **Improved quality:** Information and construction documents derived from a digital building model are consistent and automatically updated to meet stringent project schedules.
- **Centralized, intelligent database for project and operation:** The database created during the project development can be used optimally for plant operation and maintenance.

Our Experience

Powerhouses: In 2012, we introduced the BIM methodology for the design and implementation phase of the 900 MW Nant de Drance powerhouse. BIM tools were extensively used to support coordination and information sharing among owners, planners and contractors. The project was recognized with the Swiss Arc BIM Award 2017.

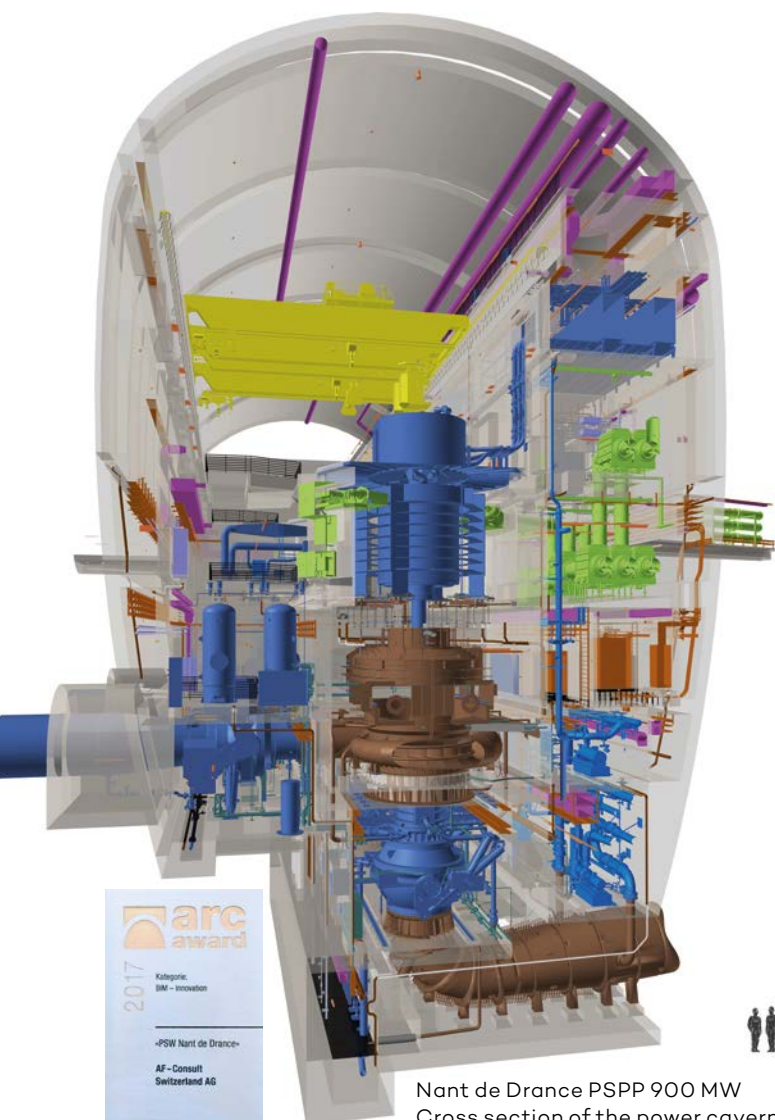
Hydropower Schemes: For modelling, reviewing and analysing complex hydropower schemes, we have extensive knowledge of BIM software tools and their specific application in hydropower projects.

AFRY is a partner of **Bauen digital Schweiz** and **buildingSMART Switzerland**



BAUEN DIGITAL SCHWEIZ
BÄTIR DIGITAL SUISSSE
COSTRUZIONE DIGITALE SVIZZERA
CONSTRUIR DIGITAL SVIZRA

buildingSMART
Switzerland



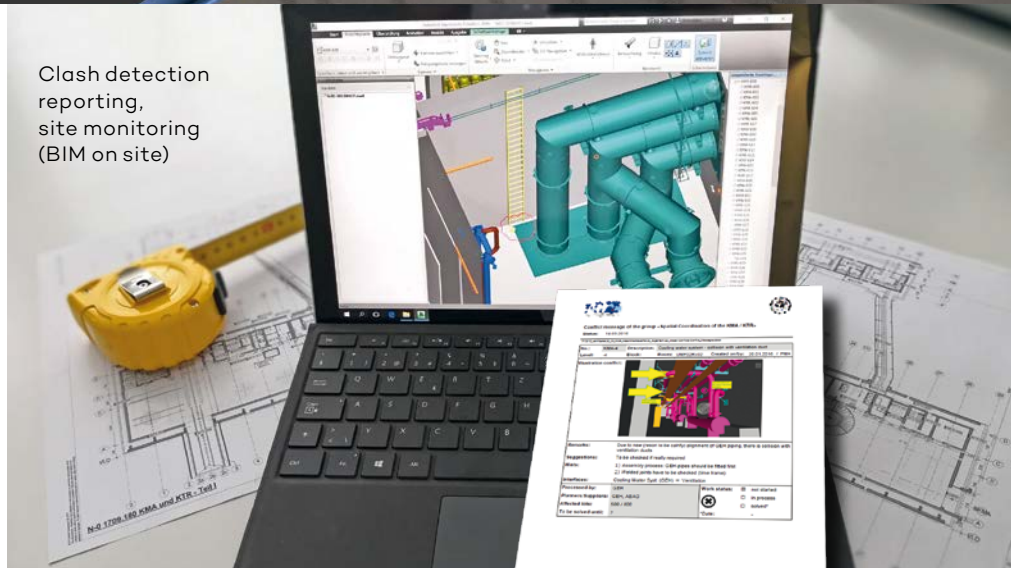
Nant de Drance P900 MW
Cross section of the power cavern

Nant de Drance PSPP
900 MW - Power
& transformer
caverns

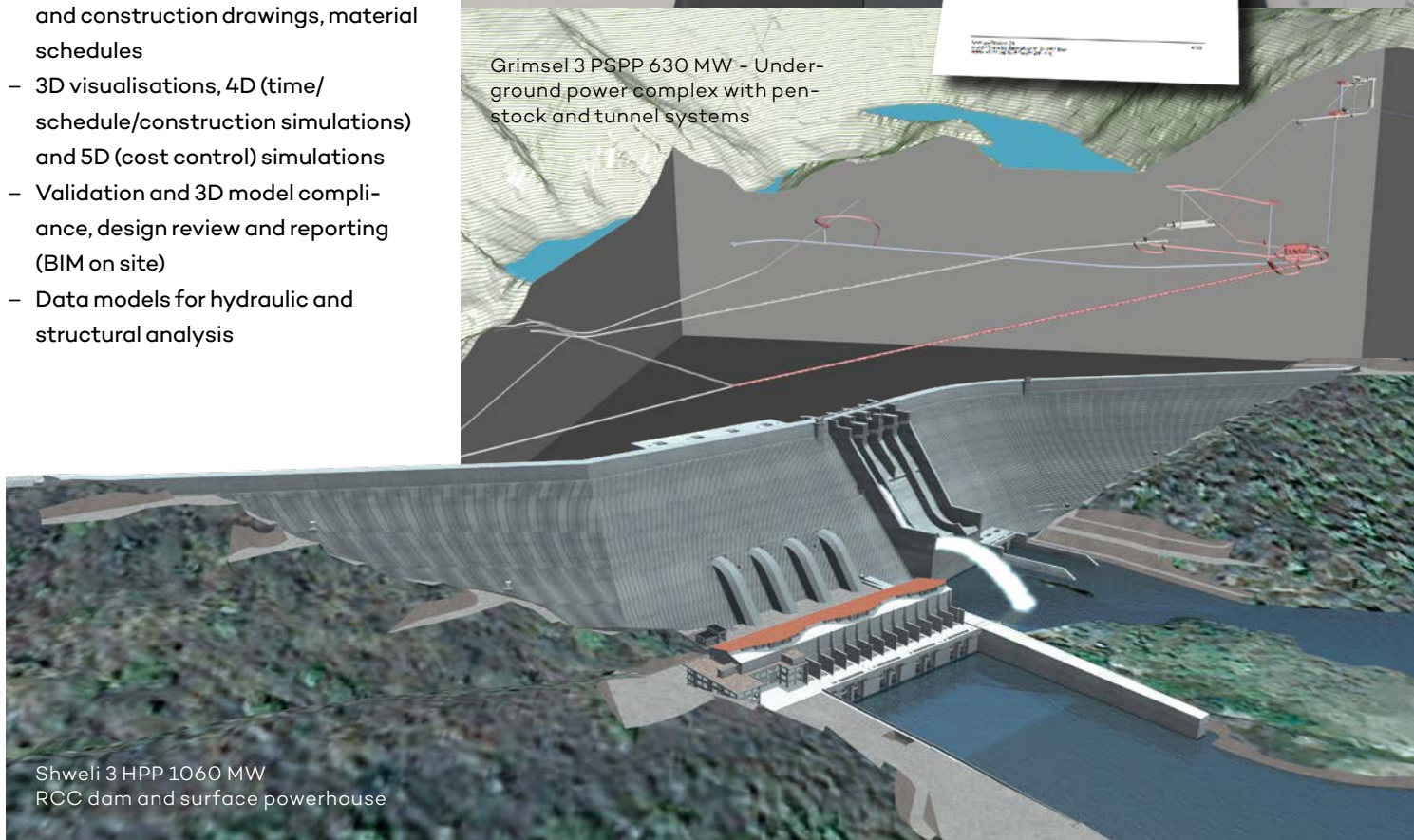
Our Services

- BIM coordination of multi-disciplinary structures such as powerhouses
- Consulting and training of BIM implementation at both project and organisational levels
- 3D modelling of hydro power schemes, powerhouses, appurtenant hydraulic structures, concrete and embankment dams, excavations and tunnel systems
- Production of general arrangement and construction drawings, material schedules
- 3D visualisations, 4D (time/schedule/construction simulations) and 5D (cost control) simulations
- Validation and 3D model compliance, design review and reporting (BIM on site)
- Data models for hydraulic and structural analysis

Clash detection reporting,
site monitoring
(BIM on site)



Grimsel 3 PSPP 630 MW - Under-
ground power complex with pen-
stock and tunnel systems



Shweli 3 HPP 1060 MW
RCC dam and surface powerhouse