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Anchoring of Bend on Penstock with PU Foam

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Background

The drop in Norwegian electricity prices in recent years has reduced the potential income for new small hydro projects, and therefore measures to reduce the costs must be introduced. Today the most commonly used backfill for penstocks for small hydro are gravel and rockfill, which is time consuming and costly due to transportation. Penstock BV with Guy Harris developed a method with polyurethane foam as a replacement for gravel and rockfill which may lead to lower investment costs and reduced construction time. Statkraft AS initiated a research project to verify this method.



The project involves the construction of Lille Måsevang Pump with a buried penstock connecting Lille Måsevang to Store Måsevang – the intake reservoir for Adamselv hydropower plant. Lille Måsevang Pump is the first of its kind where sections of the penstock, including two bends, are enveloped in polyurethane foam (PU foam).

The main objective of this master thesis is to further develop the use of PU foam for the anchoring of bends. Two laboratory tests will be carried out to investigate the structural properties of foam in bends and adhesion between foam and pipe.



Buried penstock connecting Lille Måsevang to Store Måsevang