

Synthesis of research to enable lifetime assessment of hydropower units

Main objectives

- Define state of the art and development needs in lifetime assessment for hydropower units
- Define how completed and ongoing research (within SVC and internationally) can support lifetime assessment
- Define new research needed

How the project supports sustainable hydropower

Life time assessment is essential to avoid failure, increase availability and reliability.

Impact or innovation

The project defines the state of the art in lifetime assessment and suggests needed research.

Key Results

- Result 1: Definition of damage mechanisms. From each research area known and possible damage mechanisms are described.
- Result 2: Different turbine and generator loads are described. Knowledge about loads on a structure is essential for lifetime assessment.

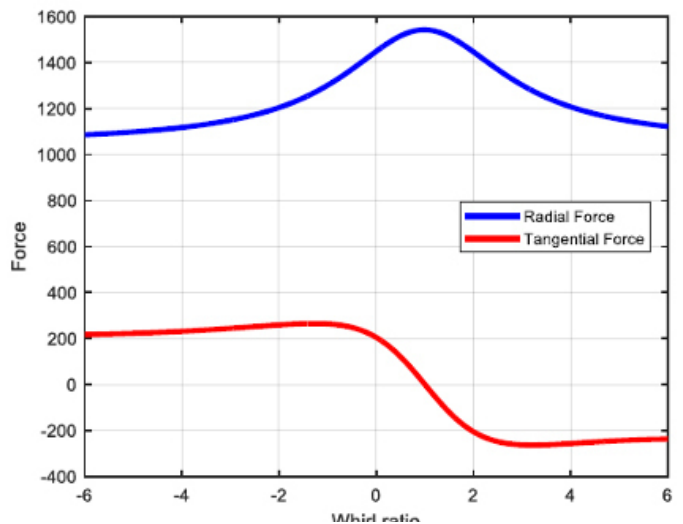


Figure 2: Whirling dependent generator loads from Svante UU.



Figure 1: Severe failure at Sayano-Shushenskaya power station 2009.



Figure 3: Instrumentation of a turbine model for load measurements in Älvkarleby (Vattenfall)



Publications / Outputs

Jan-Olov Aidanpää, Rolf Gustavsson, Carl-Maikel Högström, Michel Cervantes, Håkan Nilsson and Kim Berglund, 2025, LIFETIME ASSESSMENT OF HYDROPOWER UNITS Report Energiforsk 2025:1108.

Project

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Duration of project: 2023(April)-2024(Dec)

Project Leader

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SVC - Svenskt centrum för hållbar vattenkraft, arbetar med forskning och utveckling av teknik, system och metoder för att stärka vattenkraftens roll i omställningen till ett hållbart energisystem. SVC drivs av Energiforsk i samarbete med Luleå tekniska universitet. Centret finansieras av Energimyndigheten, Svenska kraftnät, svensk vattenkraftindustri och flera av Sveriges främsta lärosäten. SVC omsätter cirka 280 miljoner kronor under programperioden 2022–2027.