TBB. The Business Booster
BY KIC INNOENERGY

Forsnetics

Magnetic Thrust Bearings for Hydropower Generators

J. José Pérez-Loya, CEO

TBB. The Business Booster BY KIC INNOENERGY

FORSNETICS

Is a spin off from the hydroelectric mechanical energy storage HYMES innovation project

AGH

UPPSALA UNIVERSITET

VATTENFALL

eit Knowledge & Innovation Community KIC InnoEnergy

José Perez-Loya
CEO
-PhD candidate at Uppsala
-PhD candidate at InnoEnergy
-MSc Electric Power with focus on sustainable development and industry management
-2 yrs experience in power and water infrastructure.

Johan Abrahamsson
CTO
-PhD in Electricity
-5 yrs at ABB, research and management
-Expert on active magnetic bearings and electric drivelines
-MSc in Applied Physics

Urban Lundin
Senior Advisor
-Professor in Electricity
-Expert in Hydropower systems
-Taken product to full scale at hydropower station
-Actively pursuing the use of novel ideas in the industry

Björn Lindh
Business Development
-Former strategy consultant at Accenture
-Founder of iku AB, Solelia Greentech AB
-Advisor to Disruptive Materials AB, Vimator AB, Bundling AB

Why are thrust bearings critical today?

Bearings have to operate in tougher conditions

- **Integration of wind and solar power:** More start and stop operations.
- **Pump storage stations:** Bi-directional operation, High speed & pressure
- **Environmental regulations:** Oil free stations.

Thrust bearing failure has major economic effects

- **Insufficient reliability, inevitable failure:** The loss in production from an unexpected stop costs around €6 million for a 100 MW station

Magnetic thrust bearings are a clear solution, as they offer

- Increased reliability
- Loss reduction
- Cost efficiency
- Environmental superiority

We have developed the next generation of magnetic thrust bearings

Our technology is developed to respond to these drivers

Increased Reliability

✓ The goal is to eliminate thrust bearing failures.

Economic reduction of losses

✓ Our system offers an attractive ROI.

Oil free stations

✓ With programmable damping we enable oil free stations.

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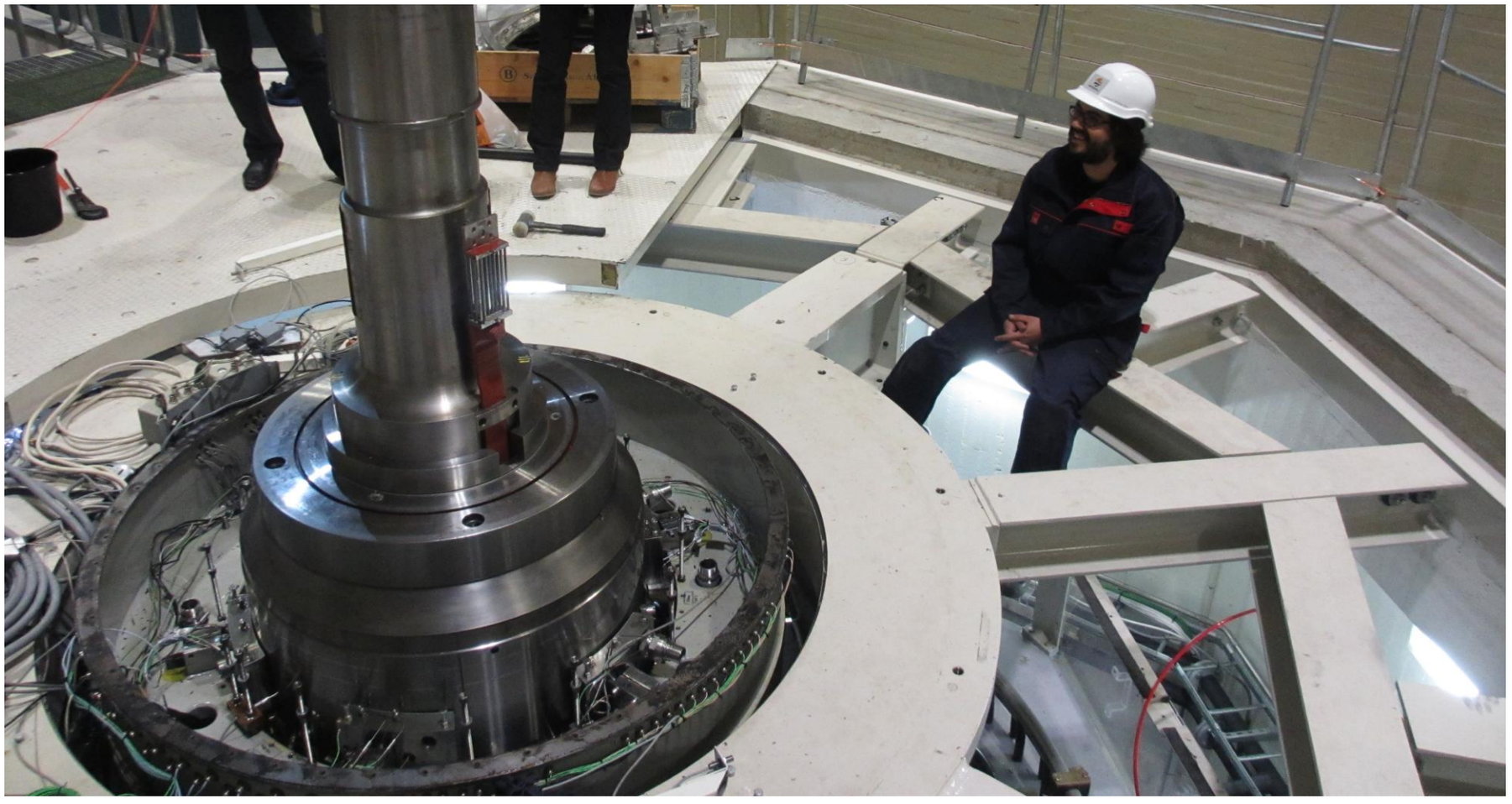
Magnetic Thrust Bearing Demonstration Project



Porjus U9 – 9.3 MW, 600 rpm, Kaplan, 150 T

The station is owned by the Porjus Foundation:

VATTENFALL

ALSTOM

ANDRITZ

We are upgrading the machine to be the most efficient hydropower generator in the world.

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Business model

Primary activities

FORSNETICS

Aimed at Customers

Pre-Studies
Training
Sales
After sale support

Aimed at OEM's

Provision of marketing material
Sales collaboration
Success stories

Support activities

Inbound Logistics	Operations	Outbound Logistics	Marketing & Sales	Service
In house Design, controllers, power amplifiers		**OEMs** ALSTOM VOITH ANDRITZ		
Manufacturers of Components Actuator, coils, electronic equipment				

Potential Customers:

VATTENFALL

HNA Yangtze River Express 扬子江快运

Verbund

Statkraft

Summary

FORSNETICS

- Forsnetics delivers magnetic thrust bearings for the hydropower industry.
- The technology enables oil free stations and increased reliability at an investment that is covered from the savings provided due to the reduction of losses in the hydropower stations.

We offer

- Lower friction in hydropower generators
- Reduced risk of expensive stops in production
- Enable 100% oil free stations

Market potential for initial product:
31 M€

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Thank you!
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