ENERGY AND UTILITIES

Hydro power plants

In a hydro unit, bearing pad temperature read against load and runner acoustics give the first warning, well before vibration limits.

Status: In operation

The five failures that matter

#	COMPONENT AND FAILURE	SIGNALS	TYPICAL WARNING	TENEURO
1	**Guide and thrust bearings**: wear, loss of oil film Contamination, misalignment or shaft instability thin the oil film and wear the white metal. Pad temperature rises against load before vibration changes.	Shaft relative vibration (proximity probes), bearing housing vibration, pad and oil temperature against load, oil level and quality.	Weeks to months as a trend; hours if lubrication is lost suddenly.	Yes. Housing vibration and acoustics. Shaft relative vibration usually comes from the existing protection system.
2	**Runner**: cavitation, efficiency loss Low pressure on the blades forms vapour bubbles that collapse and erode the metal. Eroded profiles lower efficiency at the same head and flow.	Acoustic emission and high-frequency vibration on casing and draft tube, pressure pulsations, efficiency drop at equal head and flow.	Months to years for erosion.	Yes. Acoustics is where Teneuro is strongest.
3	**Generator stator**: winding overheating Fouled coolers or reduced cooling air raise winding temperature. Heat ages the insulation and brings winding faults closer.	Winding temperatures (RTDs) against load, cooling air temperatures.	Months to years, as insulation ages.	No. Temperatures come from the plant control system. Partial discharge needs dedicated sensors.
4	**Governor**: hydraulic power unit faults Leaks, worn pumps and accumulators losing pre-charge make the unit run more often and respond more slowly. The governor closes the wicket gates, and its oil sits close to the water.	Accumulator pressure and recharge time, oil pump cycles, wicket gate position against command, oil temperature.	Days to weeks.	Partly. Governor and SCADA data are often enough. Teneuro helps on auxiliary pumps and motors.
5	**Spiral case**: clogging Debris carried by the water builds up in the spiral case and stay vanes, raising losses and reducing output at the same head.	Spiral case pressure, flow and power against gate opening and head.	Gradual, depending on the debris in the water.	No. Pressure, flow and gate position already come from the plant control system.

Also relevant: Generator rotor: air gap changes, eccentricity, loose poles; Stator insulation: partial discharge; Shaft seal: leaks and wear.

What we usually find in the plant, and how we read it

SYSTEM	VIA	LEVEL	PREREQUISITE
AVEVA PI	PI Web API	**Native**	Read access to the customer's PI server.
Vibration CMS with data in AVEVA PI	AVEVA PI	**Native**	
Plant SCADA with OPC UA	OPC UA	**1-day activation**	OPC UA interface enabled on the plant SCADA.
Andritz HIPASE, plant PLCs	Modbus TCP	**1-day activation**	
Bently Nevada System 1	OPC or Modbus	**1-day activation**	
Governors and automation on IEC 61850 or IEC 60870-5-104	Gateway	**Project-based**	

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Where predictive maintenance does not pay off

• Micro-hydro with very low power and cheap spares.
• Units that run few hours a year, where calendar maintenance is still reasonable.

There, good preventive maintenance costs less. We will tell you before we start.

Standards we work with

ISO 20816-5 — Vibration evaluation for hydro and pumped-storage units: limits on amplitude and on its changes.
IEC 61850-7-410 — Communication and data model for hydro plant automation.
ISO 14224 — Taxonomy of components and failure modes behind the Sibilla ontology.
KKS / RDS-PP — Plant coding, used to map tags to components and failure modes.

Warning times are indicative orders of magnitude from literature and practice: they depend on the duty profile and are validated on your fleet. Last updated 2026-10-03.

Next step: put your plant forward for a pilot — info@plasmiam.com · https://www.plasmiam.com/en/assets/hydro-plants

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