# INCREASING RELIABILITY OF CRITICAL GEAR UNITS *with GearWatch*

**BY JENNIE PATERSON, MARKETING MANAGER AND MIKA HIRVONEN, MANAGER, FIELD SERVICE & CONDITION MONITORING, DB SANTASALO**

David Brown Santasalo's (DB Santasalo) state of the art gear unit and drive train condition monitoring system, GearWatch, is a condition monitoring solution that uses oil particle counting as the main condition monitoring method. This delivers a completely fresh approach to prolonging the life of gear units.

Traditional methods of condition monitoring for industrial gear units have often been time consuming and expensive. These traditional options typically use vibration as the main mode of condition monitoring, meaning failures are often not detected early enough to allow for scheduled maintenance shutdowns.

Lubrication oil is considered the life blood of a gear unit and focusing on the health of the lubrication oil at an early stage and consistently monitoring it, will ensure the longevity of a gear unit. The GearWatch system focuses on oil particle and oil quality measurements, where faults and possible upcoming problems are detected much earlier than with alternative methods.

GearWatch also uses a cloud service-based system, which makes it possible to have access to data 24/7, along with access to the support of DB Santasalo's condition monitoring experts. GearWatch identifies the need for action to be taken before the gear unit is damaged, prolonging its life-span and minimizing downtime at a customer's premises. It also allows for the creation of a planned maintenance schedule up to a year in advance, creating an extremely cost-efficient system.

This versatile system can also monitor important devices used in hydro power plants, such as generators, turbine controlling oils and turbine shaft supporting bearings.

GearWatch can be tailored according to the turbine type, with the option of installing a combination of vibration sensors, oil analyzing units, particle counters and oil quality sensors. The particle counter capabilities include the monitoring of both ferrous and non-ferrous particles, so it can be used to track the health of gear wheels, rolling bearings and white metal bearings.

## *GearWatch Case Study*

### Supporting the Hydro Power Industry

DB Santasalo was proud to have installed two Gearwatch units at a Campbellford generating station owned by Peterborough utilities. In 2016, David Brown Santasalo installed their proprietary GearWatch condition monitoring system onto an 11MW planetary gear unit and turbine, which controlled oil for their customer in the Hydro Power industry.

## **PART 1:** EARLY DETECTION OF TOOTH FAILURE

**The cumulative particle levels remained at a low level of 75 from the period DBSantasalo commenced monitoring in 2016 until September 2019, when the GearWatch system detected the particle levels had started to rise. The levels were closely monitored and by February the particles had risen to over 1600.**

**Our team of field service engineers attended the customer's site to perform an endoscope inspection on the gear unit and was able to detect early stage tooth failure in the planet wheel. After consulting with the customer, they made the decision to install the spare gear unit and perform an overhaul on the main gear unit. Over a month after the overhaul, the GearWatch system detected just one particle in the unit.**

## **PART 2:** POSITIVE ENVIRONMENTAL IMPACT

**In April 2020, the GearWatch oil quality sensor detected a water leakage in the customer's turbine that was controlling oil from turbine impeller seal. As the leakage was detected immediately, an oil leak from the power plant into the nearby river was prevented, which was vital from an environmental perspective. Furthermore, the leakage was small enough to avoid any secondary damages within the turbine.**

## **PART 3:** DELIVERING COST SAVINGS

**The GearWatch system also monitors the oil temperature. In August 2020 an alarm was raised due to the temperature of the turbine controlling oil rising to 68°C, which was well above a 'normal' temperature of 55°C. After a thorough inspection, a faulty thermostat was identified and no secondary damages occurred.**

**In total, the customer saved over 500,000 EUROS (1Million Cdn$). These savings were achieved through the avoidance of major overhauls and subsequent plant shutdowns. By detecting failures and issues at an early stage, the customer experiences longevity and high performance for longer periods of time.**

*To find out more about how GearWatch can transform your business, visit their website at www.dbsantasalo.com/products/gearwatch-condition-monitoring/. Watch the GearWatch animation, here: https://vimeo.com/400601132.*