Enel Green Power predicts maintenance needs for sustainable hydropower operation with ABB Ability™ Asset Performance Management

An increasingly competitive marketplace means an ever-demanding need to improve asset reliability so that production is always maximized. Cost pressures resulting from lower prices of fossil fuel energy are leading operators like Enel to improve business performance through reduced maintenance spend. Additionally, assets are aging, and operators are looking to maximize asset productivity before they replace equipment. Many new assets are more complex and require advanced technology to monitor and maintain. Moreover, an aging workforce is retiring and taking its wealth of knowledge with it. Businesses must find ways to preserve and protect this knowledge base. That’s where ABB comes in.

Enel is a long-standing ABB customer familiar with ABB’s commitment to innovation and operational excellence. Employing the expertise of the ABB Ability™ Collaborative Operations Center for power generation and water, the two companies partnered in 2018 to develop predictive and condition-based maintenance software that would move the hydropower plants to an advanced data-driven management model to improve sustainability of Enel’s operations, reduce maintenance costs and transform its performance, reliability and energy efficiency.

ABB Solution
Market research firm Frost & Sullivan reports that energy businesses today spend more than 30% of their operating expenses on unplanned maintenance. This includes events such as equipment failure or equipment underperformance that lead to unplanned downtime and lower productivity. Operations practicing corrective or reactive maintenance are often faced with more of these undesirable events. ABB Ability™ Asset Performance Management (APM) is a tiered maintenance methodology that supports operators in the transition from corrective maintenance to condition-based and predictive maintenance. This allows the operations and maintenance staff at energy businesses to have higher visibility into equipment performance so they can better plan for equipment maintenance, replacement or repair.

In the Enel Green Power implementation of APM, the high amount of data gathered allows the benchmarking of four new Key Performance Indicators (KPIs) focusing on the risk management of an identified equipment fault.
Four Risk Management Key Performance Indicators

01 Key diagnostic indicator: the health status of a component. The three most abnormal health and fault indicators.

02 Note, the time trend for each as shown here (earlier UI).

03 Clicking “show more” on the summary displays the bar chart, showing all the health indicators in barchart form.
04 Key trend indicator: the remaining time until a critical threshold is reached.

Clicking on a bar (see 03) selects the value to be plotted on the analysis chart, the user may add a second signal and select the time period to be retrieved from the historian.

05 Clicking on the “chart” symbol displays a time trend for both indices. As with all the trend displays, the user selects the time period required as shown.

06 Fault presence probability: the probability for the occurrence of a fault.

Note that Severity and Probability refer to different means of calculating the fault predictor.
A collaborative partnership

08 Enel Green Power has partnered with ABB to deliver innovative predictive maintenance solutions that will lower maintenance costs and transform the performance, reliability and energy efficiency of its hydropower plants throughout Italy.

Project highlights

Sustainable hydro
Enel was seeking sustainable hydro operations to lower maintenance costs and transform performance, reliability and energy efficiency

Working on conceptualization since 2018

Co-creation through proven pilot project
To develop and test predictive maintenance and advanced solutions on five plants in Italy and Spain

33 hydroelectric plants
Of Enel Green Power’s hydro fleet across Italy

190,000 signals
Including analysis of over 190,000 signals

To shift operational models
Move from hours-based maintenance

To be more efficient and predictive
To predictive and condition-based maintenance

190,000 signals
Including analysis of over 190,000 signals

800 asset models
And deployment of ~800 digital asset models

Gains for Enel

1 Reducing unplanned failures and maintenance costs

2 Enabling more efficient planned maintenance practices

3 Increasing plant productivity

Enabling more efficient planned maintenance practices

Increasing plant productivity