

GE Digital’s Autonomous Tuning Accelerates the Energy Transition with Artificial Intelligence and Machine Learning

- *Software reduces harmful emissions and fuel consumption with Artificial Intelligence /Machine Learning enabled continuous tuning for gas turbines*
- *Lower total cost of ownership, operational flexibility, and productivity can result in payback in under one year*
- *Power Generation plants have realized carbon monoxide reduction by 14%, nitrous oxide emissions decreased by 10% - 14%; fuel and carbon dioxide reduction between 0.5 and 1 percent*

SAN RAMON, Calif. - January 20, 2022 -- [GE Digital](#) today announced the introduction of software that ensures gas turbines operate with ideal combustion for reduced emissions and fuel consumption. [Autonomous Tuning](#) uses Artificial Intelligence (AI) to build a machine learning (ML) Digital Twin model of a gas turbine to continuously find optimal flame temperatures and fuel splits to minimize emissions and acoustics. The on-premises software senses changes in ambient temperature, gas fuel properties, and degradation, and sends real-time automatic adjustments to the controls every two seconds.

Gas turbines require seasonal adjustment of flame temperatures and fuel splits, which is generally a manual process performed by an expert after an outage and may take a few days to complete. However, manual seasonal tuning is only efficient for the precise conditions in which it was completed and does not respond to changes in ambient temperature or fuel properties.

“With Autonomous Tuning, GE Digital has introduced a practical industrial example of the use of machine learning in closed loop supervisory control, and all running at the Edge,” according to Joe Perino, Principal Analyst at LNS Research. “This is a real-world application of AI for decarbonization with tangible reductions in emissions and fuel for gas turbine operators. This, and other building block sub-



systems, are a step toward autonomous operations.”

The goal of Autonomous Tuning is to allow for tracking of the turbine’s “sweet spot” (operational conditions with low acoustics and low emissions) in response to changes in environmental conditions, fuel properties, or physical degradation, and reduce the need for seasonal remapping. The software is applicable to any OEM gas turbine platform. The software is also fully bound by the turbine controls system’s safety-critical programming - ensuring it cannot harm the turbine.

“Gas turbines are becoming increasingly critical as the world looks to produce energy from lower carbon sources,” said Linda Rae, General Manager of GE Digital’s Power Generation and Oil & Gas business. “While they offer a better alternative to coal, they can be made more efficient with software. Digital solutions like Autonomous Tuning are no longer optional. The energy transition demands we employ every measure for efficiency.”

Power generators who benefit the most from this software are located in highly regulated regions or with constrained emissions, such as Europe, the United States and Canada, or in any location that does not have consistent weather patterns. In addition, any site subject to fuel-quality variability issues or sites looking to reduce their Operations & Maintenance (O&M) cost by reducing manual tuning and fuel consumption will benefit. Power Generation plants have realized carbon monoxide reduction by 14%, nitrous oxide emissions decreased by 10% - 14%; and fuel and carbon dioxide reduction between 0.5 and 1 percent.

Customers will enjoy full-service deployment of the on premises solution and calibration of the software to run autonomously without plant personnel intervention.

Click on these links for more information about GE Digital’s full suite of [Power Generation](#) and [Oil & Gas](#) software solutions.

<https://www.gevernova.com/>

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