



Rolls-Royce

Fast ramp-up mode upgrade

Maximise profitability of your power plant





Reciprocating engines can efficiently make up for voltage dips from renewables

Ramp-up to full load in approximately half the time

If your engines were built for base-load operation and this mode is no longer profitable due to environmental regulations or other factors, we can help by rebuilding them to function as efficient back-up units. This helps ensure profits for your business, while simultaneously supporting the development of an environmentally friendly electricity system that delivers end users with a stable power supply.

To stabilize grids featuring renewable energy sources, responsive back-up power that adapts quickly to changes in demand is critical. As load dispatchers give preference to power plants with short start-up and ramp-up times, players on the spot market must often guarantee power delivery no later than 15 minutes following the request. Our fast ramp-up mode upgrade allows your engines to do just that.

With a relatively low capital investment, your engines can be rebuilt for fast ramp-up mode which enables them to reach full power output in about half the usual time (8 minutes or less depending on the original plant design) while maintaining high efficiency across the load profile.

The upgrade makes your system respond flexibly to any grid fluctuations and the resulting peaking, providing the required reserve capacity promptly and smoothly.

From base load to flexible grid support

Convert your plant to a profitable asset that fits perfectly into today's electricity market

Benefits from the upgrade

- Fast starting and ramping capability providing fast power supply to the grid
- Converts your plant to a profitable asset enabling you to sell back-up power at spot prices
- Higher start reliability thanks to a combination of the reciprocating engine's operating principle, robust design and supporting heating systems that enable "hotstart"
- Increased capability to endure frequent starts and stops so that the equipment can deliver reliable grid support
- Higher efficiency at part-load compared to other technologies, thanks to improved software with NOx control capabilities
- Faster ramp-down so that total output can quickly be adapted to grid fluctuations

Note: as each plant is unique, and upgrade packages are customized to your specifications, all benefits outlined above may not be included in every supply.

Applicable installations

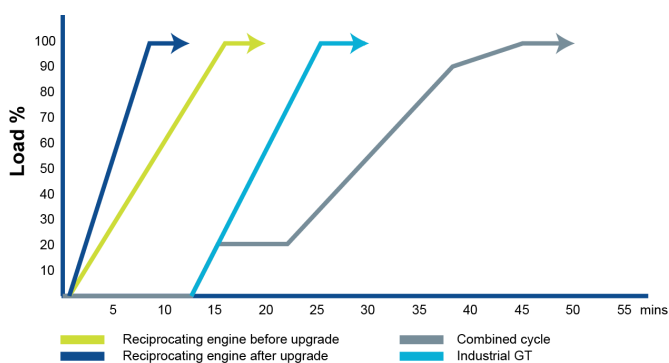
Engine type	Fuel type
KV	Gas
BV	Gas

During the upgrade, we assess the following items and upgrade / install the associated components (if required):

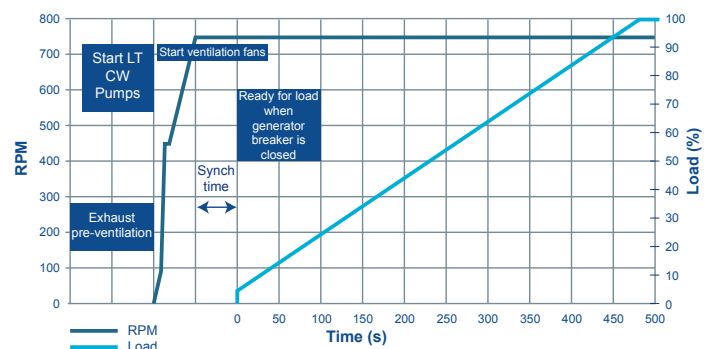
- PLC unit
- TPS/TPL Turbocharger
- Governor
- NOx sensor
- PID regulation on 65HT
- Cooling water temperatures
- Lube oil temperatures
- Splash oil monitoring
- CPU

Upgrade and test-run requires approximately 2-4 days.

Improvement of ramp-up times



Fast-ramp sequence



The future energy scenario

Renewables are undoubtedly going to form an increasingly important part of the future energy mix. However, electricity production from renewables varies based on availability of intermittent energy sources such as wind and sun, which is difficult to predict. The demand for electricity is also variable and may not match the power supply from renewables. That is why firm capacity is required to support renewables. Gas engines have the potential to provide outstanding grid support and are therefore an ideal supplement to renewables.



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