How You Benefit

The MXL2 upgrade allows operators to switch between two modes of operation: M-mode and XL-mode. Online switching between the M and XL mode is achieved at the touch of a button.

- In the M mode, power output can be increased up to 25 MW in combined cycle, and the combined cycle efficiency by 0.8%. Maintenance Intervals are extended by 4,000 operating hours.

- In the XL mode, maintenance intervals are further extended up to 12,000 operating hours, increasing availability and reducing maintenance costs. The overall plant power output can be increased up to 12 MW and the combined cycle efficiency by 0.5%

**CUSTOMER BENEFITS**

- Improved operational flexibility Operational flexibility with online switching between M and XL modes
- Increased performance up to 456 MW power output and and 59.8% efficiency in combined cycle operation
- Reduced maintenance costs Inspection interval extended up to 12,000 operating hours

**TECHNICAL FEATURES**

Flexible mode switching, the perfect response to fluctuating market demand

- When market demand is high, plant operators can instantly switch to the M mode for maximum power and efficiency.
- When demand is lower, operators can switch to the XL mode with a temperature drop that reduces the thermal loading on components.
- The XL mode translates into an extension of the maintenance interval by 12,000 operating hours, thereby reducing maintenance costs.
- The GT26 MXL2 Upgrade brings class-leading flexibility, opening up new revenue opportunities to plant operators meeting increasing grid challenges.

Ansaldo Energia's MXL2 upgrade for GT26 gas turbines offers new levels of availability, flexibility and performance. It allows power plant operators to adapt to fluctuating market demands, enhancing performance and reducing maintenance costs. The MXL2 Upgrade now comes with an unrivalled maintenance interval of 40,000 EOH.

MORE PERFORMANCE, LIFETIME AND FLEXIBILITY

The GT26 MXL2 upgrade is an evolutionary product that combines technological advances and many years of operational experience into a single attractive upgrade package for Ansaldo Energia's GT26 gas turbines.
Technical Specifications

The core of MXL2 is the implementation of the latest low pressure turbine (LPT). The components are well proven technology shared with the latest GT26 rating 2011. All necessary work for the Upgrade implementation can be completed on site during a regular C-inspection.

LOW PRESSURE TURBINE

Based on proven technology shared with the latest GT26 rating 2011, all four stages of the LPT, including the heat shields, have been redesigned:

- 3D airfoil profiling was applied to all stages to achieve highest aerodynamic efficiency, and the flow path at the turbine outlet is increased.

- To support the increased turbine inlet temperature when operating in M mode, the components protection by thermal barrier coating has been enhanced.

- Optimised part count: Lowering the vane part count in the LPT vane rows 1 and 2 reduces the required cooling air, thereby increasing the overall turbine efficiency.

- The cooling schemes of all components have also been optimised.

- Reduced losses: Improved shroud design of LPT blades and vanes leads to a reduction in over-tip leakages enhancing the aerodynamic turbine efficiency.

COMBUSTOR

Sequential environmental (SEV) combustor: Modifications to the inner liner of the SEV combustor were introduced to adapt to the redesigned vane 1 and to optimise cooling at the interface with the LPT. The pre-swirl nozzle at the rotor cover has been reworked for improved cooling of front stages.
MECHANICAL INTEGRATION
Accomodating the new Low Pressure Turbine may require:
- The upgraded LPT blading requires a newly cast and modified TVC. A new intermediate ring is also part of the package.
- Turbine housing 2: The turbine housing 2 has to be adjusted to match with the requirements of the new TVC.
- Exhaust gas housing: Exchange or re-work of the exhaust gas housing is needed to accommodate the geometry of the upgraded LPT.
- Rotor: Rework of blade 3 cooling air feeding. These modifications can be done on site.
- A new operating data counter (ODC) allows online switching between the two modes at any time with different lifetime and performance characteristics.

Performance

The MXL2 Upgrade package was tested and validated in the Ansaldo test power plant in Birr, Switzerland. This is the only full scale testing facility available worldwide for the GT26 fleet and is now with Ansaldo Energia. This was followed by a successful installation and validation on a commercial GT26 engine in 2009. Since 2009, the MXL2 upgrade has been implemented in several other plants during scheduled C-Inspections and helped customers to remain competitive under different market conditions. The MXL2 is now an established and proven upgrade. Customers are reaping the economic rewards of the increased performance, the improved operational flexibility and the reduced maintenance costs through the extended inspection interval.

<table>
<thead>
<tr>
<th>GT performance gain*</th>
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<tbody>
<tr>
<td>Power Output Improvement</td>
<td>Up to 25 MW&lt;sub&gt;cc&lt;/sub&gt;</td>
</tr>
<tr>
<td>Efficiency Improvement</td>
<td>Up to 0.8 %</td>
</tr>
<tr>
<td>Maintenance Interval Extension OH</td>
<td>Up to 12000</td>
</tr>
</tbody>
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* Reference values in ISO conditions, specific data to be evaluated case by case
GT26 MXL2 Gas Turbine, United Kingdom

For more information and to reach our sales Team, please go to www.AnsaldoEnergia.com