PSM GTOP Upgrade Packages for the 7FA: 
Increase Output and reduce heat rate, while extending component life cycles and inspection intervals, by installing PSM’s GTOP Upgrade Packages.

Due to the evolving global power generation market and customer demand, operators of 7FA gas turbines continue to seek operational and durability improvements that provide significant improvements in reliability and availability. Using technology successfully in operation since 2005, PSM 7FA GTOP Upgrade Packages are a proven alternative for PSM customers looking for overall plant flexibility and reduced life cycle costs.

Using baseline cycle performance models, calibrated to match fleet engine data, PSM has identified areas where cost effective technology enhancements can provide a financial benefit to customers. Examination of 7FA performance models reveals that increasing compressor inlet flow, reducing combustor pressure drop, and reducing turbine cooling and leakage air (TCLA) are powerful variables to improve cycle performance.

PSM’s 7FA GTOP3.0 and GTOP3.1 Upgrade Package offerings optimize critical performance variables.

**GTOP3.0:** Installed during a standard hot gas path (HGP) outage, the package consists of PSM’s 7FA GTOP1 low pressure drop combustion system and redesigned 1st and 2nd stage turbine components. Turbine components incorporate alloy and cooling technology improvements to enable TCLA reductions.

**GTOP3.1:** GTOP3.1 builds on the GTOP3.0 upgrade package, incorporating aerodynamically redesigned front stage compressor airfoils that provide increased compressor inlet flow at constant compressor efficiency for additional performance gains at a constant IGV position. Installation does not require a rotor destack.
Main Features and Benefits

PSM’s 7FA Upgrade Packages provide flexibility, enabling users to **optimize performance and component lifetimes** to their individual requirements.

**Key Features: GTOP3.0**
- Installed during a standard HGP or Major outage
- Incorporates low pressure drop combustion system (GTOP1)
- Upgrading alloys and implementing TBC enhancements and improved efficiency cooling features.
- PSM AutoTune System
- Maintains NOx emissions <9ppm
- Maintains set-wise interchangeability with standard 7FA hardware
- Controls system modification
- Firing temperature increase within 7FA experience
- Turndown enhancements

**Key Features: GTOP3.1**
Includes GTOP3.0 features plus the following:
- Installed during a modified HGP or Major Outage
- Aerodynamically redesigned R0, S0, and S1 rows for increased compressor inlet flow at constant efficiency
- GTOP3.1 components designed for equivalent mechanical integrity characteristics as PSM proven R0, S0, and S1 designs, successfully operating since 2008

**GTOP 3.0 & 3.1 Options include:**
- Extended component life cycles: Increasing the hot gas path inspection interval (HGPI) from 24,000FH to 32,000FH
- Additional performance at standard life cycle
- Or, the ability to switch between the two operating modes as desired

**YELLOW = GTOP 3.0 & 3.1**
**BLUE = GTOP 3.1**
Standard GTOP Packages deliver significant output and heat rate benefits* versus the baseline 7FA.03.

- Simple cycle output increases up to 14MW
- Simple cycle heat rate reductions up to 2.4%
- Combined cycle output increases up to 35MW
- Combined cycle heat rate reductions up to 1.5%
- Demonstrated low load operating capability down to 40% load

*Quoted benefits are for ISO day operation. Combined cycle benefits assume 2X1 plant configuration.

Your Benefits

- Increased power output, from both the simple and combined cycles.
- Reduced heat rate, from both the simple and combined cycles.
- Ability to extend HGP component inspection and lifetime intervals.
- Installable within a standard HGP or Major outage.
- Maintain setwise interchangeability with standard 7FA hardware.
- Facility changes not required: No reroutes of external bleed pipes or installation of costly external systems required to achieve performance benefits.
- OEM TP’s can be reworked to the GTOP configuration to reduce installation cost.
- Repair technologies to recondition upgrade designs are consistent with standard 7FA hardware.
- Demonstrated turndown to 40% load.

Contact your PSM Sales Representative for more information.
Call: 561.354.1100 or email: sales@psm.ansaldoenergia.com

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