

MS3002H-J Advanced Technology Uprate

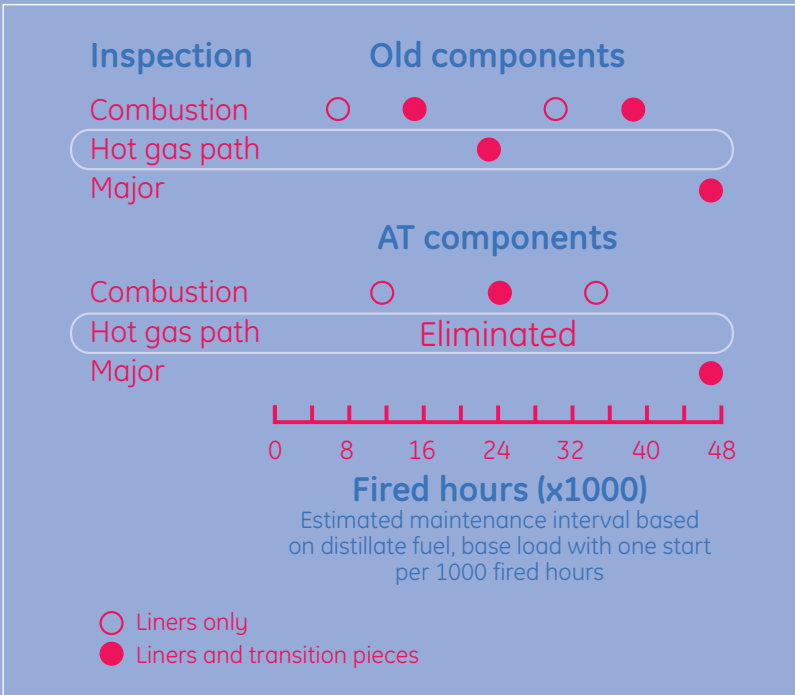
Benefits

- ■ ■ Increased production
- ■ □ Higher efficiency
- □ □ Compliance with environmental regulations
- ■ □ Availability and Reliability
- ■ □ Life extension

The table and graph below summarize the main benefits of the MS3002J-Advanced Technology (AT) compared with the previous J model. This advanced technology uprate extends scheduled maintenance intervals, from 8,000hrs to 12,000hrs.

Performance	MS3002H-J	MS3002J AT (*)	Δ
Power kW	10,890	11,290	+3.7%
Heat rate kJ/kW h	13,480	13,440	-0.3%

(*) New and clean expected values obtained with natural gas at ISO Condition



What it is

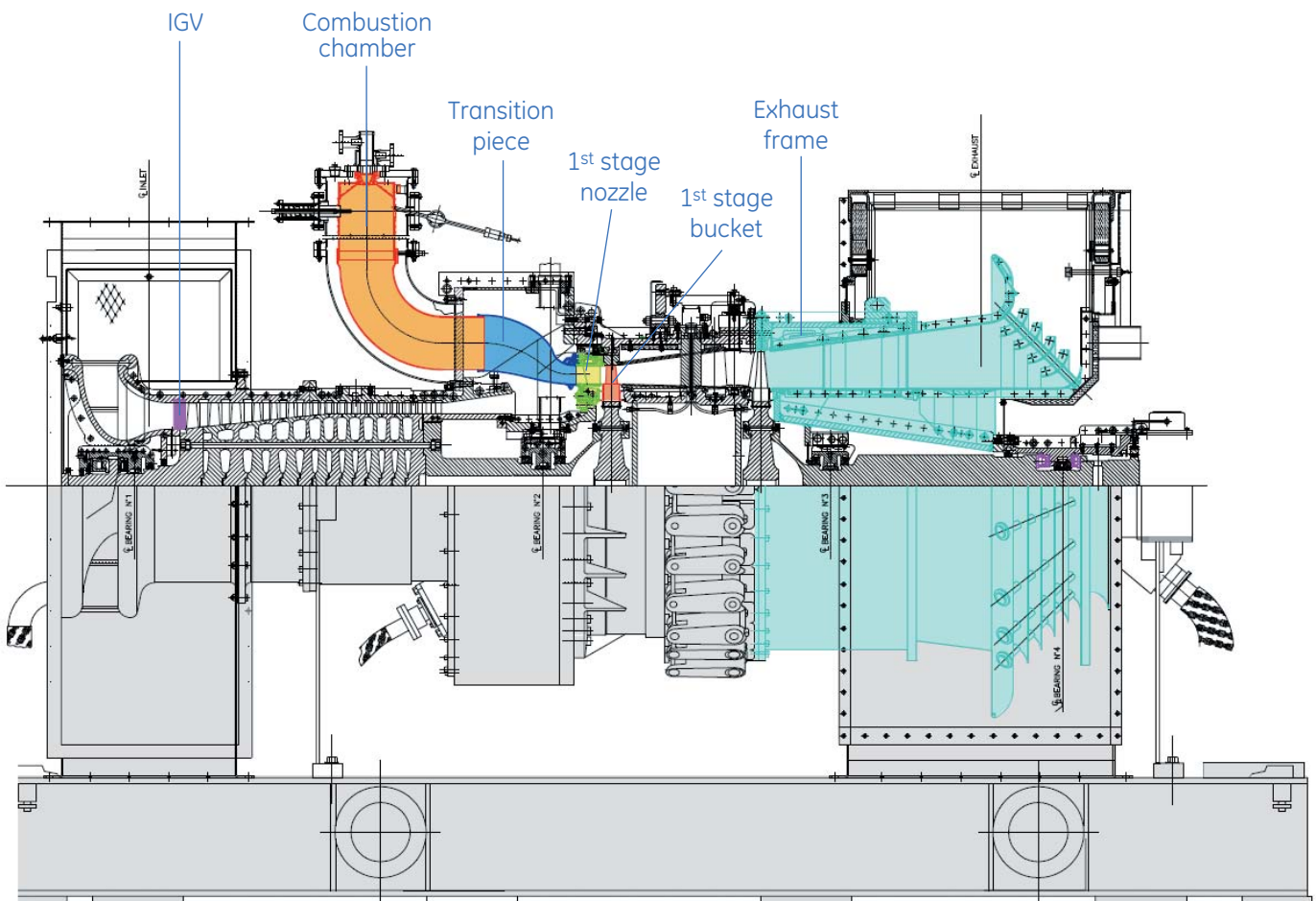
Our GE gas turbine engineers have developed new technology for advanced machine designs, and adapted these improvements to the operating fleet of units. The resulting gas turbine uprates and upgrades deliver great gains in power output, efficiency and reliability with corresponding reductions in emissions, longer inspection intervals and lower maintenance costs, all with minimal investment and installation expense. Examples of these developments include:

- New bucket materials to permit higher firing temperatures with concurrent efficiency/output gains
- New coatings and coatings techniques
- New combustion components designed for longer component life

The MS3002J advanced technology Uprate package was developed to increase output and extend maintenance intervals.

The modification kit replaces existing main components (1st Stage bucket and nozzle, support ring, combustion liners, transition pieces, etc.) with advanced technology components. Changes to the original designs and in materials over the years have enhanced unit performance and reliability, while decreasing the need for maintenance.

Model MS3002H-J	Simple cycle	Regenerative cycle
Ship date	1992-1999	1922-1999
Power range (hp)	To 15,140	To 14,000
Firing temperature (F°)	1,750	1,730
Air flow (10 ³ Lb/hr)	415	415
Heat rate (kJ/kW-h)	13,483	10,484



How it works

The original MS3002H and J gas turbines were introduced in the 1960s in simple cycle or regenerative cycle applications.

The MS3002J-AT project has been developed to modernize the MS3002, aiming to prolong the operating life of the worldwide Frame3 fleet and to raise its overall performance band to the level of modern gas turbines.

Thus, the main focus has been placed on increasing the thermal efficiency and on maximizing the availability. All this has been achieved through the implementation of leading edge technology recently developed by GE Oil & Gas.

These advancements, now available for retrofits as an advanced technology uprate package, can increase your MS3002's power output and firing temperature up to 15,140 hp and 1,770 °F.

Combustion inspection intervals are extended by 50 percent with the hot gas path inspection at 24,000 firing hours eliminated.

For hot climate installation, the exhaust frame replacement is a recommended option.

It should be noted that the performance benefits given by AT uprate decrease at high ambient temperature (see Figure 1).

The stainless steel exhaust diffuser is designed to perform at higher discharge temperature values, so that the gas turbine can operate at full firing temperature in a wider range of ambient temperature, resulting in higher power output and improved efficiency.

Replacement of uprated parts can be done during a major inspection.

Scope of Supply

The AT uprate must include the following:

- Cap and liners
- Cross fires tubes
- Transition pieces
- Combustion inner elbows with assembly hardware
- 1st stage nozzle
- 1st stage buckets
- Low pressure rotor thrust bearing
- Control curve modification

Outer elbow can be included if necessary.

Stainless steel exhaust diffuser benefits

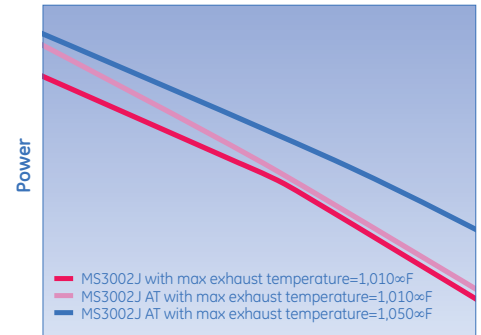
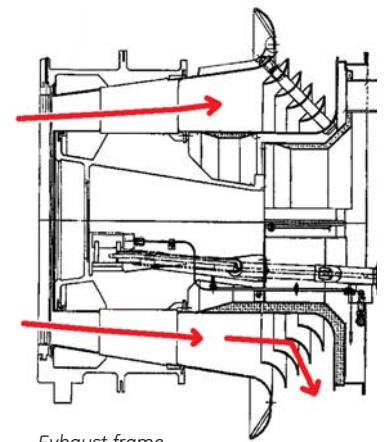


Figure 1 Ambient temperature



Exhaust frame

	Package 1	Package 2	Additional
PERFORMANCE	AT uprate	AT uprate & exhaust frame replacement	
Firing temperature	1,770 °F	1,770 °F	
Output	+ 3.7%	+ 3.7%	
Heat rate	- 0.3%	- 0.3%	
Exhaust temperature	1,000 °F	1,050 °F	
Exhaust flow	420 klb/hr	420 klb/hr	
MAINTENANCE			
Reliability/availability	X	X	
SCOPE	<ul style="list-style-type: none"> • High flow IGV • Cap and liners • Cross fires tubes • Transition pieces • Combustion inner elbows with assembly hardware • 1st stage nozzle • 1st stage buckets • Low pressure rotor thrust bearing • Control curve modification 	<ul style="list-style-type: none"> • Package 1 • Exhaust frame replacement 	<ul style="list-style-type: none"> • Compressor reblade • Simple to regenerative cycle conversion • Regenerative to simple cycle conversion • Advanced sealing system • MS3002K



GE imagination at work

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COMK/MARK 839/II - Designed by: Studio Tre Fasi
Printed by: Sagraf - 1-2008
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