



# Hubbard Aviation Technologies

Gulfstream Operators' Conference  
Bernie Weiss, President & COO  
June, 2012

# FAA Modernization & Reform Act of 2012

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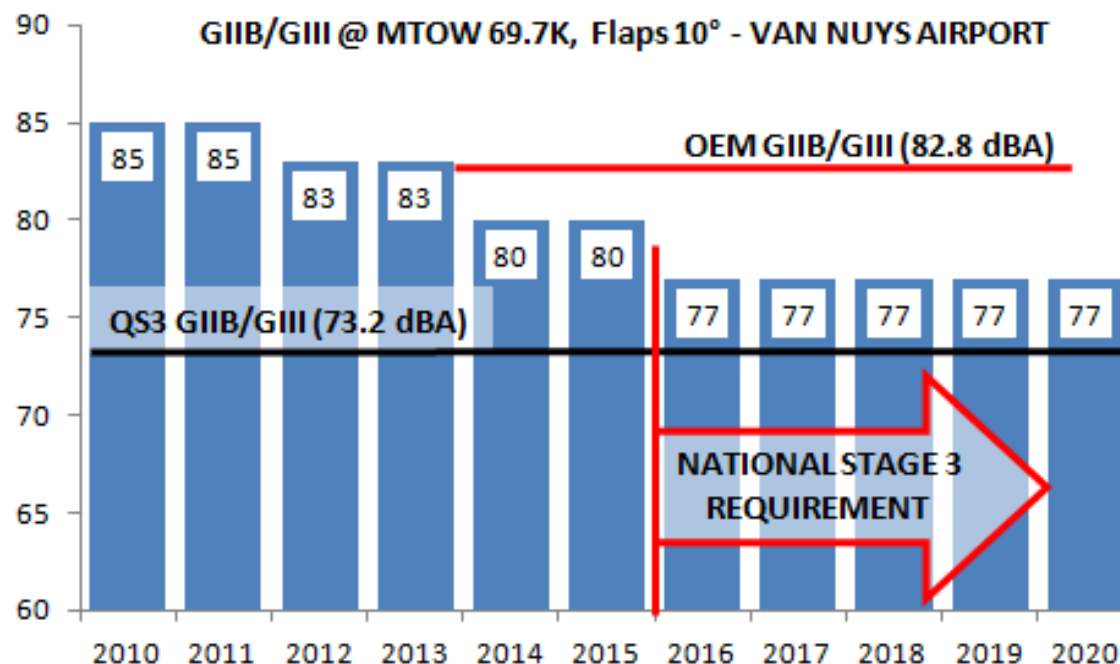
- ▶ Bill Signed into Law on February 14, 2012.
- ▶ Section 506: Prohibition of operating certain aircraft weighing 75,000 pounds or less not complying with Stage 3 noise regulations.
- ▶ Stage 3 noise compliance required on all Gulfstream II, IIB and III's in the United States by December 31, 2015.

# Van Nuys (VNY) Noise Abatement and Curfew Regulation

- ▶ Effective December 31, 2013 all aircraft based at Van Nuys (regardless of “grandfather” status) must not exceed 80 dB noise level.
- ▶ The noise level can only be achieved with a noise suppression system.
- ▶ Nationwide Stage 3 is required after December 2015.

## Takeoff Noise Level - dBA

(Source: FAA AC36-1H)



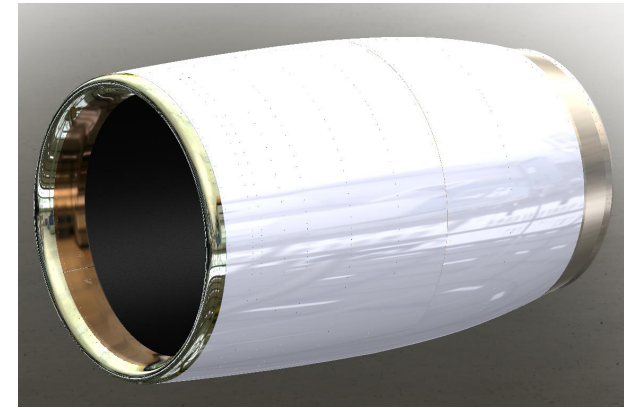
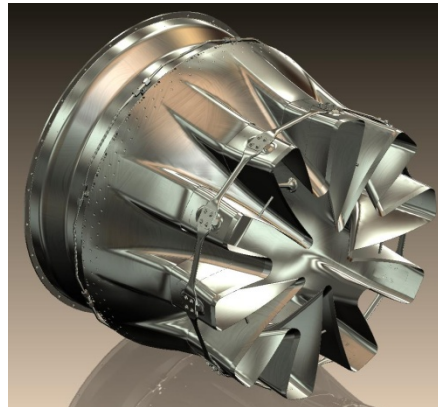
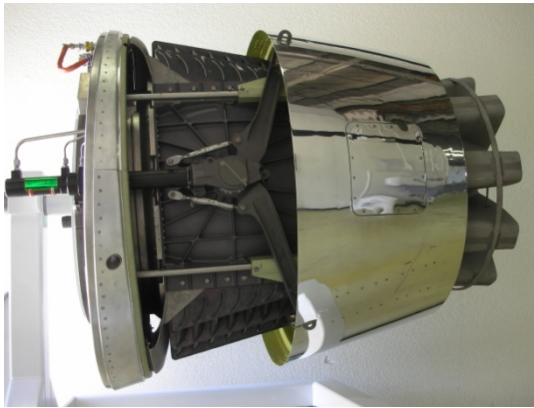
# Options

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- ▶ Upgrade, sell outside the United States or retire
- ▶ The G-II and G-III are extremely capable aircraft competitive in range, comfort and reliability.
- ▶ The installation of a Hubbard Aviation QS3 Noise Suppression System maintains all performance levels the same as the OEM while meeting Stage 3 standards:
  - ▶ Full Gulfstream-approved EPR takeoff settings
  - ▶ Choice of Gulfstream-approved Flaps 10° or Flaps 20° takeoff
  - ▶ Runway lengths same as Gulfstream Flight Manual

# QS3<sup>®</sup> Noise Suppression System

- ▶ **Thrust Reverser, Mixer-Nozzle and Ejector:**
  - ▶ Predominately Titanium Construction



- ▶ System delivers performance up to 6.2 dB below Stage 3 limits at OEM takeoff power, maximum gross takeoff weight and standard flap settings.
- ▶ All GII & GIII aircraft are capable of achieving Stage 3 minus 5 dB when equipped with a QS3 system.
- ▶ Interior passenger cabin noise reduction of 22% is additional benefit.

# Future of Noise Monitoring and Performance

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- ▶ Recent “Navigating NexGen NOW” conference of airport managers focused on measuring for compliance.
- ▶ Just having a Stage 3 STC will no longer be sufficient for the noisier aircraft. Some European airports have instituted a “Chapter 3 (same as Stage 3) minus 5 dB” limit on noise with further consideration of tightening levels.

**QS3 Noise Suppression System delivers the quietest Stage 3 solution!**

# Value

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- ▶ The big question is, “Do you upgrade, sell or retire?”
- ▶ Current market values do not reflect the competitive performance capabilities of these airplanes
- ▶ The most rational way to balance capital, operating costs and mission requirements suggests a strong bias to upgrade.



# Performance Summary

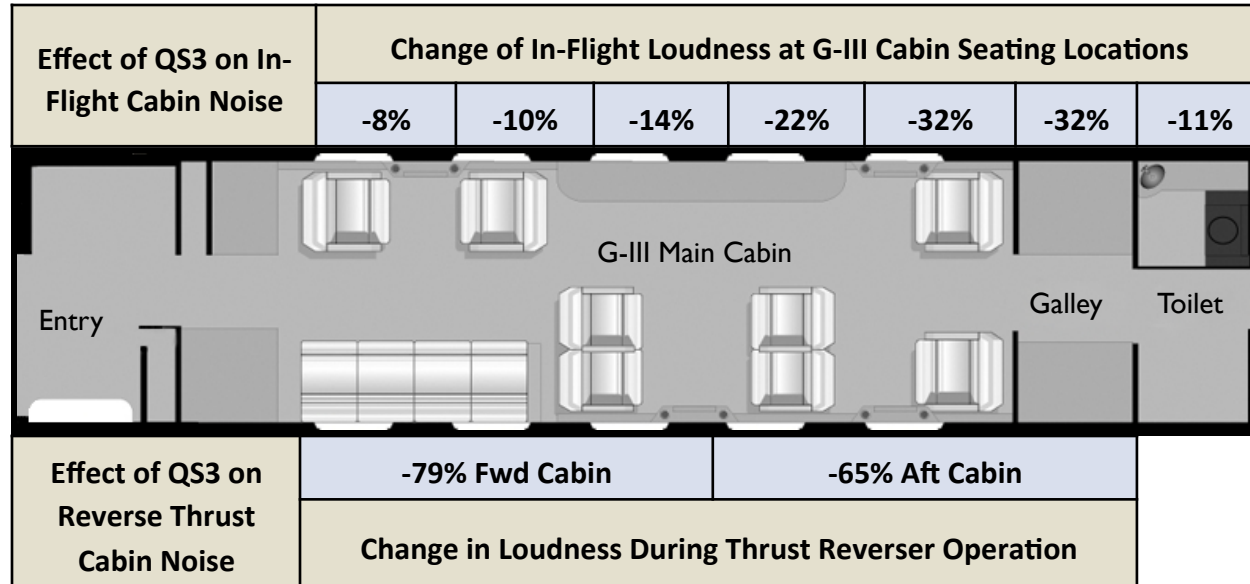
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- ▶ **QS3 System allows operators to achieve full potential of the aircraft as designed by Gulfstream while attaining Stage 3 noise levels.**
  - ▶ Full power (EPR) as defined by Gulfstream AFM
  - ▶ Standard flap settings as defined by Gulfstream AFM
- ▶ **System incorporates new cascade-style thrust reversers:**
  - ▶ 15 dB quieter than OEM (with Stage 2 hushkit)
  - ▶ Eliminates turbulence and “shudder” on deployment
  - ▶ Reduces operating cost.



# Cabin Noise

- ▶ Passenger Cabin Noise is Reduced By 22% Average



*“the science of quiet<sup>®</sup>”*

