



TECHSAVIATION

Training Center

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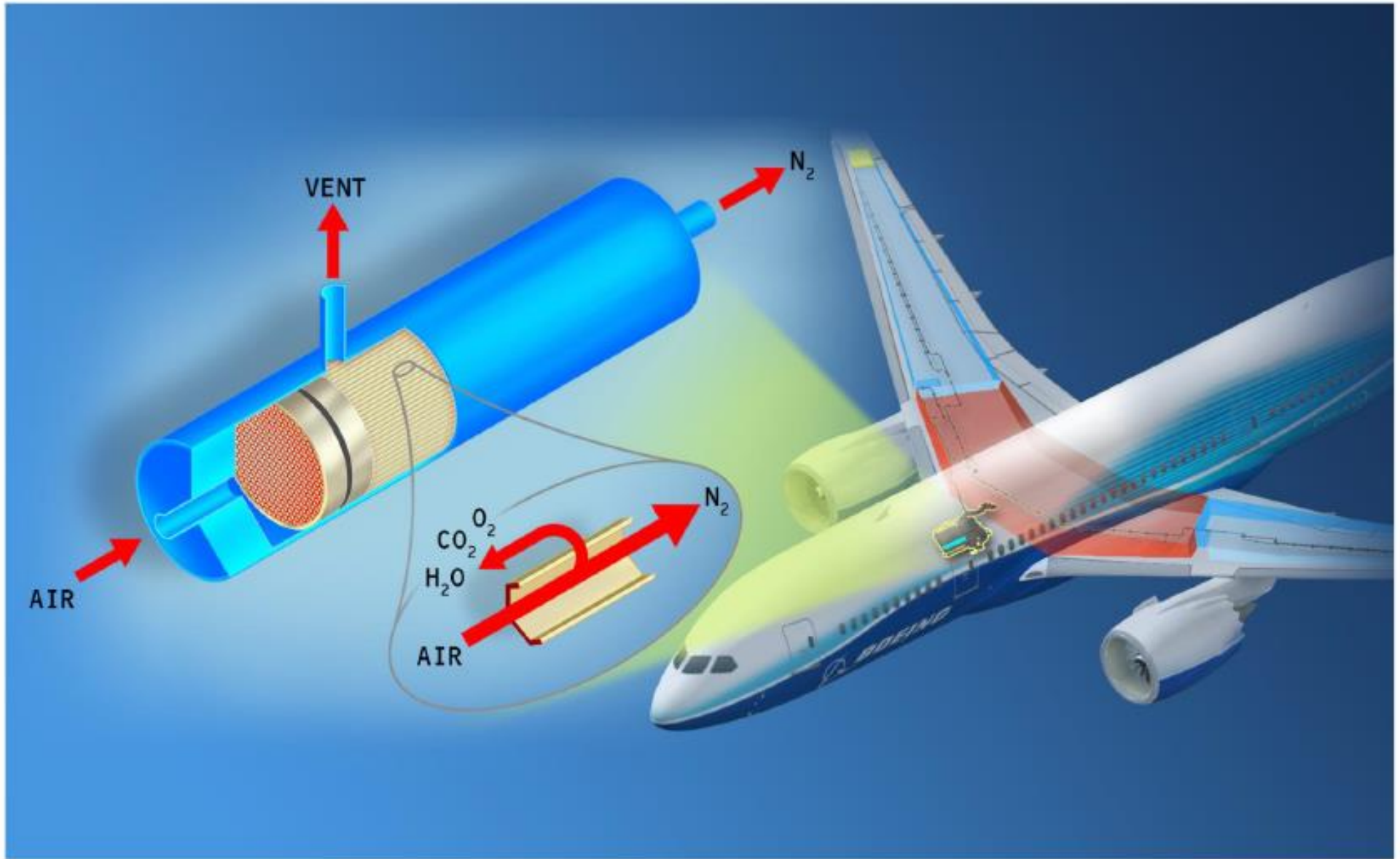
Introduction

The Nitrogen Generation System (NGS) makes Nitrogen Enriched Air (NEA) that is sent to the airplane fuel tanks. This is done to decrease the tank flammability.

The NGS uses passenger cabin exhaust air to produce the NEA. There are no controls for the NGS because it is a fully automatic system.

The NGS normally operates if the airplane is on the ground with the APU running, during taxi, and during flight.

It does not operate during main engine start or from takeoff to flaps up.



Nitrogen Generation System

The NGS has these components:

- Control system
- NGS pack
- Distribution system
- Structural thermal protection system.

The NGS control system is a software application in the right Common Computing Resource (CCR) cabinet.

The NGS pack produces the NEA. It has these components:

- Electric motor-driven, two-stage compressor
- Heat exchanger
- Ram air cooling system
- Air Separation Module (ASM).

The distribution system sends the NEA to the fuel tanks. Three isolation valves control the flow of the NEA into the respective tanks.

Check valves prevent fuel vapors from going back to the ASM.

The structural thermal protection system detects any hot air leaks from the NGS pack. If there is a motor compressor overheat or a hot air leak, the NGS will shut down.

Operation

The air first goes through the NGS shutoff valve to the motor-driven compressor. The output from the first stage of the compressor is cooled in the heat exchanger and sent to the second stage of the motor-driven compressor.

Some of the air from the first stage is also routed through the motor compressor stator for cooling purposes.

The air from the second stage is now sent through a combined air filter and ozone converter before entering the ASM.

The ASM is made up of five individual units. Each unit consists of numerous hollow fibers, each with a selective membrane designed to allow nitrogen to easily pass through while other gases such as oxygen cannot.

The oxygen-enriched air is vented overboard through the ram air exhaust and the NEA is sent to the distribution system.

The distribution system sends the NEA through a check valve and then through three isolation valves to the fuel tanks.

