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MICROVANES™ IMPROVE FLEET OPERATING EFFICIENCIES

For Lynden Air Cargo, Metro Microvanes Are More Than Just Skin Deep

THE CUSTOMER

Headquartered in Anchorage, Alaska, Lynden Air Cargo is part of the Lynden family of transportation companies with service extending around the world.

The company's fleet consists of eight civil C-130's (L-100's), the largest in the world, that carry over-sized and bulk freight to remote and challenging destinations, as well as to some of the world's most devastating disasters.

They support customers in the mining, construction and energy industries and have mobilized operations to support projects around the globe, including the Department of Defense Air Mobility Command and the Civil Reserve Air Fleet (CRAF).

The company's pilots have thousands of hours of flight time, and its employees pride themselves on providing safe, reliable and friendly air cargo service year-round.

THE SITUATION

Transporting cargo internationally with a L-100 requires a significant amount of fuel given the less-than-aerodynamic design of large rear cargo aircraft, which presents challenges from both cost and environmental perspectives.

As a leader in sustainability initiatives, Lynden believes going green is good business, and that small changes can add up to big savings for business and the environment.

Lynden has been awarded multiple Green Stars in Alaska for its intense focus on green initiatives.

As such it was looking for new cost effective technologies to reduce the environmental impact of its operations.

Sustainability

Innovative Technology

Cost Effective

GREEN STAR®

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THE SOLUTION

Given its focus on improving fleet operating efficiencies, Lynden had been tracking a drag-reduction technology developed by Lockheed Martin's Skunk Works® and offered by Metro Aerospace called Microvanes.

Key Features:

- Strategically surface mounted on the aft body of rear loading cargo airframes.
- Microvanes reshape tail section airflow, reducing the significant amount of drag created on aircraft.
- Ideal for the C-130, C-17, L-100, and KC-135.
- Also lowers both fuel and thrust requirements.

Used by fleets across five continents, Microvanes reduce fuel consumption, carbon emissions, and engine wear through lower turbine inlet temperatures (TIT).

According to engine manufacturer guidelines, reducing TIT by 30° C through conservative operation can increase an engine's life by as much as 250 percent".

Lynden chose to pilot Microvanes on a single aircraft after the Canadian Air Force and U.S. Coast Guard installed them on their large aircraft.

"We had enough preliminary information to proceed with installing the first set of Microvanes for us to collect data on. We evaluated Microvanes on that first aircraft for several months, taking in-flight cruise data and correlating it to fuel uplifts, and saw a statistically significant difference between pre and post Microvanes performance. They were doing what they were supposed to do."

-Ethan Bradford, Vice President of Technical Operations for Lynden Air Cargo.

"The Microvanes definitely cleaned up the airflow and reduced the drag, allowing us to increase air speed at the same power settings. We actually have to either reduce the power setting sooner or reduce speed, both of which reduce the fuel consumption and engine temperature." Ethan Bradford, Vice President of Technical Operations for Lynden Air Cargo.

THE RESULT

During the pilot, Lynden realized a **3.03 percent** increase in indicated air speed (IAS) at cruise, creating a reduced fuel consumption and ultimately reducing carbon emissions by an estimated **505,764 pounds** over an average year of flying. After seeing this **6.7 knot** increase, Lynden continued testing and calculated an actual **7 knot gain**.

As a result Lynden installed Microvanes on all eight of its L-100's. Lynden pilots flying with Microvanes reported an unabated climb directly to cruise altitude without the need to step climb when carrying a heavy cargo and fuel load.

Crews also noticed they were hitting higher than expected speeds and having to throttle back sooner, which gave them the option of getting to destinations earlier than scheduled, or throttling back to a lower setting to keep the same schedule but use less fuel. The fuel savings will allow Lynden to recoup the cost of the Microvanes within approximately 15 months since installation across the fleet.

CONSIDERATIONS

Lynden Air Cargo has a thorough maintenance and inspection program to keep their fleet running and in optimum condition. With aging aircraft, Bradford says minor skin cracking has always occurred in the elevator skins over time, particularly the lower skins that are original and 0.020 in thickness.

Lynden is proactively in the process of upgrading specific elevator skins for the entire fleet to thicker skins where needed and conducting adequate inspections to ensure reliable operations.

"We already know thinner skins will have issues with cracking over time, which is why we're proactive with our inspections and maintenance, especially when we're talking about a 45-year-old skin that's going to fail at some point no matter what. For us, the operational and green benefits we've realized with Microvanes are more than just skin deep." *- Ethan Bradford, Vice President of Technical Operations for Lynden Air Cargo.*

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MHD-ROCKLAND is the International distributor for Metro Aerospace Microvanes.

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