

THE VALUE OF DATA

Data-Enabled Analysis Fuels More Fight



EFFECTS OF LANDING HEAVY

The Deputy Assistant Secretary of the Air Force for Operational Energy (SAF/IEN) is pursuing comprehensive, automated, high-resolution, and accurate fuel use data. At the end of FY17, only a third of Air Force aviation fuel use was captured on a sortie-level basis. SAF/IEN moved to collect and analyze data from a wider range of sources (e.g. paper 781H, MAJCOM databases, and Aircraft Structural Integrity Program records).

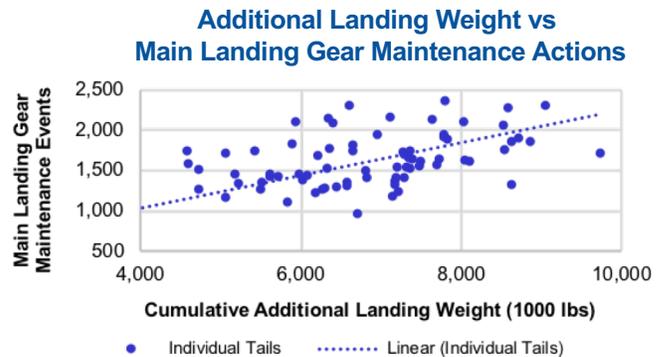
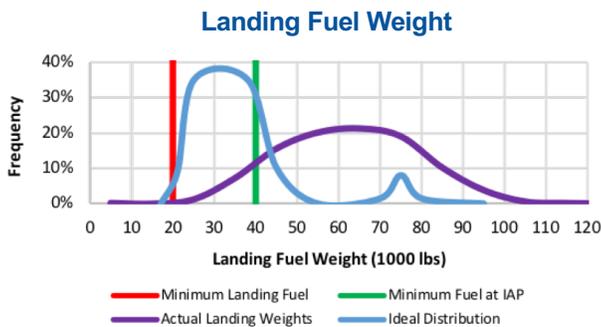
Sortie-level data analysis indicates that carrying more fuel than required for a mission increases fuel burn. For example, optimal landing fuel weight for the aircraft in graphic below is between 20K and 40K lbs. However, data reveals that the aircraft are landing much heavier – on average 30K heavier than the target range. Carrying additional fuel increases fuel burn by 3.5% per year.

The value of data rests in its power to rapidly adapt and dominate in evolving air, space, and cyberspace domains. Data is vital to the Air Force’s ability to fly, fight, and win our nation’s wars.

IMPACTS FROM LANDING HEAVY	
Additional Fuel Burn	1.8-5.3%
Maintenance Hours	350 hours per aircraft annually
Aircraft Availability	41 days NMC fleet-wide (Landing Gear only)

WHY IT MATTERS

This case study is an example of how data-enabled analysis supports energy optimization by reducing aircraft maintenance and increasing combat capability. These findings identify no- or low-cost process changes that provide significant impacts to the Air Force enterprise.



Landing with more fuel than required for the mission has implications well beyond fuel burn. Analysis of landing weight and maintenance data demonstrates that, for this aircraft, carrying additional fuel leads to increased maintenance on the main landing gear. The sample data shows that landing with more fuel than required creates six times more landing gear maintenance actions than anticipated. This equals 350 extra maintenance man-hours per aircraft annually, and impacts aircraft availability and readiness.

Heavier landing weight has additional second and third order effects yet to be fully examined. For example, heavy landings increase the inspection interval for C-17s, which may impact upper wing skin and aircraft lifespan.

Deputy Assistant Secretary of
AIR FORCE OPERATIONAL ENERGY



OUR MISSION

To enhance combat capability and mitigate operational risk to the warfighter through energy-informed solutions.

OUR VISION

To create an energy optimized Air Force that maximizes combat capability for the warfighter.

OPTIMIZING OPERATIONAL ENERGY LEADS TO:



INCREASED
Combat Capability



INCREASED
Aircraft Lifespan



LOWER
Aircraft Maintenance Costs



MORE
Training Opportunities

\$5-7 BILLION

is spent on Air Force aviation fuel **ANNUALLY**

81% of the Air Force **ENERGY BUDGET** is spent on aviation fuel

2 BILLION

GALLONS of aviation fuel used by the Air Force **ANNUALLY**

8,000

additional sorties fueled from a **1% EFFICIENCY INCREASE**

#FUELMOREFIGHT



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