

ascend

Taking your airline to new heights

JET STREAM

A conversation with Wolfgang Prock-Schauer, the chief executive officer of Jet Airways.



Special Section

FUELING UP

A look at the rising cost of fuel and its effect on the industry.



INSIDE

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Saving Fuel

Given the high cost of oil, there are many things airlines can do to minimize their fuel usage.

■ By Jennifer C. Cheung and Peter Berdy | Ascend Contributors

An airplane and a spaceship share many characteristics: both carry payload over a certain distance through the air. Both can only go so far, so fast, so high, and can carry limited fuel and cargo. There will be trade offs between the cargo versus fuel carried: more fuel carried could mean they can go farther, but that less cargo will be carried. But, for a spaceship, a mission control will ensure these variables are carefully considered, and, of course, that the total mission stays within budget.

In the case of a commercial airplane, “mission control” does not always do a comprehensive job of managing all the variables to stay within budget since its roles and responsibilities may be splintered across different parts of the operation. There may not be a mission control “command center” that can grasp all the variables to make decisions to keep the mission within budget, since the variables are not in its control.

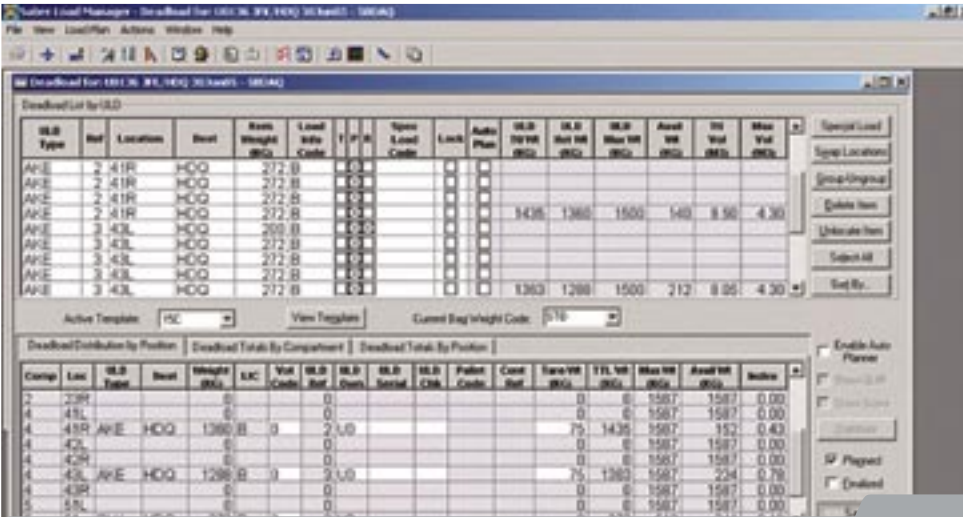
After performing many fuel conservation projects for different airlines, the *Sabre Airline Solutions* consulting practice identified interesting facts about fuel and fuel conservation as well as human factors that can make a big difference to an airline’s bottom line:

- Airlines pay nearly US\$100 per barrel of fuel. Assuming the base price of crude is around US\$70 to US\$75 per barrel, it costs around US\$20 more per barrel to refine crude oil to Jet A fuel for use in commercial airplanes.
- A really big fuel bill is managed by a really small number of people. Fuel is about a third of an airline’s costs. However, most airlines have very few people whose job it is to measure and manage the total fuel expenditure compared to other cost areas. An effective fuel management organization can pay for itself many times over.

Flt	Org	Dest	A/C	FAIR	ALTI	ALT2	CRZ	FPR	ETE	ETE	OUT	IN	RAMP	HOLD	OTR	MTOW	BURN	STATUS
801	LAS	LAX	305		SAB		1600	009	1600	0047			0966	1747	0	8020	3283	CHECKLIST
803	LAX	PHX	305		YUN		002	1045	0056				1056	1748	0	8024	3204	CHECKLIST
875	PHX	ABQ	305				002	2230	0102				0034	1753	0	8023	4033	CHECKLIST
876	ABQ	PHX	305				002	0000	0101				0320	1748	0	8027	4007	CHECKLIST
100	ABQ	STL	100		IND		1640	004	1650								117000	CHECKLIST
730	LAS	ABQ	100		PRO		1650	002	1650	0120			18146	0	0	110130	3130	CHECKLIST
673	SAN	PHX	305		TUS		1720	003	1830	0048			0409	1748	0	8043	3473	CHECKLIST
620	PHX	LAX	307				1757	001	2000									CHECKLIST
671	ABQ	PHX	305				1800	001	2000									CHECKLIST
660	PHX	DEN	304		COG		1810	012	2000		2000	2210				91840		CHECKLIST
730	ABQ	STL	100		IND		1800	004	2000								117000	CHECKLIST
501	MIA	STL	104				1905	001	2105									CHECKLIST
100	STL	IND	100				2020	001	2230									CHECKLIST
804	DEN	PHX	304				2030	001	2240			2240	0025					CHECKLIST
804	PHX	DEN	308				2114	001	2215									CHECKLIST
730	STL	PHX	100				2120	001	2330									CHECKLIST
102							2130	001	2340									CHECKLIST

Dispatch Monitor, one of the primary modules of *Dispatch Manager*, expedites access to data for load, crew, weather, NOTAM, e-mail, shift log, remarks, alternate weather, MEL and MTOW information. Using this module, dispatchers have requisite data to calculate, release and file the flight plan that optimizes both fuel and operating costs by basing calculations on optimized routes, vertical profile and speeds.

- For each extra pound of weight carried on an airplane, about four percent of that weight in fuel needs to be uplifted to carry the extra weight per flight hour.
- Just like skin, pimples are bad — small bumps on the surface of the airplane’s skin can affect performance, translating to more fuel consumed. Even a small dent will translate into 45 to 370 additional annual liters of fuel. A square meter of rough skin on an airplane can translate to 3,000 to 12,000 additional liters of fuel consumed in a year. Many airlines are moving to a comprehensive program to look at all the small details to reduce drag, which can produce fuel savings.
- Button the hatches properly. A five millimeter surface mismatch in a door seal can result in consuming 9,000 liters of additional fuel in a year.
- Airplanes are like people — they gain weight over time. This can come from items added over time such as through repairs, add ons, paint build up. It goes without saying that the heavier the airplane, the more fuel that will be necessary to carry the extra weight.
- Weight management is important. Carrying the right amount of potable water, maga-



The dead load window in *Load Manager* enables the load planner to display dead load information by compartment or position. From one central window, the load planner can efficiently manage the selection of dead load templates; group or ungroup load items; input special load information; and access statistical information for baggage, cargo and mail.



The load planner can easily choose one or all limits to display by clicking the desired limit button. The chart is a powerful tool in which the load planner can view the weight and balance envelope at any time of the load planning process.

Fuel-Saving Systems

While the first priority in flight planning is to meet all safety and regulatory requirements, the flight-planning process can have a dramatic economic impact through optimization of route, altitude, speed, payload and fuel. A flight-planning system plays an important role in determining dispatchers' and flight planners' productivity and efficiency in completing their duties.

The *Sabre® Dispatch Manager* is designed to automate the process of flight planning. It assists flight planners and dispatchers in developing and optimizing flight plans that contain required fuels, weight limitations, clearance information, assigned cockpit crew names, NOTAMs, navigation data, weather and aircraft performance data. The system also supports pre-flight planning for aircraft and route evaluation. *Dispatch Manager* optimizes flight plans by choosing the best route, speeds and altitude profile, according to parameters set by analysts, who can request flight plan optimization by minimum cost, fuel or time. For minimum cost optimization, the *Dispatch Manager* cost index method determines the route with the lowest overall cost, taking into account fuel costs, operating costs by time, crew costs and overflight charges.

Although automated load planning tools have been available to carriers for many years, some airlines still perform manual weight and balance. A major reason for the manual system is to avoid the cost of buying an automated system. What these airlines are failing to realize is the associated cost savings in reduced fuel burn and proper center of gravity loading of the aircraft. In addition, the manual process is time consuming and at greater risk for human error, especially when last-minute changes must be made and ground personnel are trying to avoid a flight delay.

Improving an airline's load planning functions while increasing profitability is an ongoing process. Plus, airlines need to strengthen the entire operations, increase integration, ensure air safety and reduce fuel, all while maximizing payload.

Sabre® Load Manager, unlike weight and balance systems, is a sophisticated load planning solution designed to automate the process of load control and provide a consistent, accurate and straightforward means of performing required weight and balance tasks. The system provides a full range of features including load planning management tools, calculation of maximum and actual structural weight limits (zero fuel

zines, blankets and other items will affect fuel consumption.

- Shifting the center of gravity slightly aft has a significant effect on fuel consumption and payload. Airplanes perform better when they are slightly tail heavy.
- Sometimes it is better to be fuel heavy and carry more fuel. Why? Because there can be considerable variability in the cost of fuel at different stations. Some stations can be significantly more expensive than others due to

cost of shipping and transporting fuel. Airlines often use a fuel ferry model to determine the trade off between carrying extra fuel versus paying more at the next station.

- Small details can matter. Some carriers such as Southwest Airlines prefer gates closer to the runway. A few meters less may mean shorter taxi time and a bit less fuel consumed.
- People sometimes forget and need to be reminded every day about fuel conservation.

weight, takeoff weight and landing weight) for each flight section scheduled, and adherence to International Air Transport Association and industry standards as well as aircraft design specifications. The system graphically shows the load planner the ideal center of gravity for the flight and the corresponding cargo load plan to achieve the optimum center of gravity. The load planner can also view an illustrated representation of the current weight and balance status of the zero fuel, take-off, landing, and ramp limits in the selected aircraft. Similar to a canoe or an oil tanker, aircraft must have their loads balanced to navigate safely, efficiently and profitably.

Successful airlines must also carefully calculate passenger, cargo and fuel weights to maintain their competitive advantage. *Load Manager* helps airlines create the optimal balance to meet these goals as well as save fuel. The system improves weight calculations by automatically allocating weight according to passenger type: adult (male and female), child and infant. The user may define special weight parameters for winter and summer as well as special weights for heavier passengers (football teams). Any unused weight allowance can be reallocated for additional cargo or revenue passengers. An automated load planning system, such as *Load Manager*, calculates the ideal trim and issues loading instructions to achieve the optimum center of gravity. The optimized center of gravity calculated by *Load Manager* produces the ideal trim during the final stages of load planning and accounts for any in-flight center-of-gravity changes caused by the reduction (burning) of fuel. By using the *Load Manager* ideal-trim tools and loading aircraft to the optimized center of gravity, airlines can potentially reduce their fuel costs by .03 percent to .05 percent.



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Ground activities such as starting an aircraft engine, taxiing a jet and runway selection can have a significant impact on fuel burn. If managed properly, each of these activities can reduce an airline's fuel costs.

There are several well-known fuel conservation practices that need re-enforcement, a few of which include items such as :

- Almost every airline knows it should use ground power units when possible over auxiliary power units. An APU is essentially another jet engine in the airplane that burns fuel when it is used to cool an airplane on the ground. It may be easier to turn on the APU, resulting in a rising fuel bill.
- Fuelers sometimes load a bit more fuel than is actually needed. Again, more weight will translate to more fuel consumed.
- Pilots have some discretion over the routing used, fuel carried under their watch, climb and descent procedures and cruise speed.
- Maneuvers on the ground including starting engines, taxi procedures and choice of runway may result in extra fuel consumed.
- Cost index optimization is often ignored. Many airlines don't remember when the last time their cost index was examined or whether they have the capability of modifying it for better performance, especially in older airplanes. The cost index is a parameter that takes into account the relationship between time-related costs, such as crew and maintenance and the cost of fuel.
- Engine performance will affect fuel. Although this would seem obvious, some airlines forget to do the obvious, such as engine washing.
- Saving fuel costs is less painful than cutting payroll. Assuming a small airline

spends US\$100 million in fuel, half a percent improvement in fuel costs is worth US\$500,000. Using a US\$50,000 salary, this is equivalent to 10 full-time jobs. When considering that most fuel conservation programs can be improved and tuned to produce well over 2 percent improvement in fuel, this is worth US\$2 million — or 40 full-time jobs.

- How much revenue does an airline need to make up the difference of a half percent improvement in fuel costs? In the example above of a US\$100 million fuel tab, assuming in a good year that an airline has a 5 percent margin, it would need to generate another US\$10 million in revenue. Further, assuming the average roundtrip fare paid is US\$250, the airline would have to carry another 40,000 passengers. To make up the difference of a 2 percent improvement in fuel cost, an airline would need to pump revenues higher by US\$40 million. At the same fare, it would need 160,000 more passengers. ■

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