DYNAMIC STATISTICAL CONTINGENCY FUEL

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BRIEF DESCRIPTION

Airlines rely on flight dispatchers to perform the duty of fuel planning. In addition to required fuel loading categories, flight dispatchers also uplift contingency fuel to be on the aircraft to hedge against various uncertainties (e.g. weather uncertainty, traffic congestion uncertainty, air traffic control uncertainty etc.) to ensure flight safety and reduce the risk of diversions. To provide consistent and objective fuel planning, some airline Flight Planning System (FPS) provides recommended contingency fuel numbers for dispatchers based on a statistical analysis of historical fuel consumption for similar flights. This recommended contingency fuel is called statistical contingency fuel (SCF). However, due to limitations of the current SCF estimation approach, the application of SCF is limited.

Researchers at the University of California, Berkeley have developed a novel methodology based on quantile regression models to overcome the limitations of the current SCF estimation approach. The proposed method takes various factors such as weather, aircraft type, airport, and historical operational conditions into account so that SCF can be estimated in a dynamic, flexible, and more accurate way. Their results have shown that dynamic SCF performs much better than the current SCF estimated by airline FPS and also more sensitive to the specific conditions faced by a given flight. SCF calculated using this novel method will be higher under adverse weather conditions, whereas the current method for determining SCF does not take these conditions into account. The result of using this novel SCF is expected to reduce fuel loading, since dispatchers typically ignore SCF based on the current method when conditions are poor, instead simply loading a very large amount of contingency fuel. By reducing fuel loading, not only would a plan be able to take off sooner, but this would also result in reduced fuel consumption as the aircraft's weight would be reduced.

SUGGESTED USES

Improved methodology of determining the amount of statistical contingency fuel needed in aircraft

ADVANTAGES

- Sensitive and specific contingency fueling protocols for flights based on realtime data.
- Decreased fuel consumption
- Faster fueling times.

RELATED MATERIALS

CONTACT

Laleh Shayesteh
lalehs@berkeley.edu
tel: 510-642-4537.

INVENTORS

» Hansen, Mark Merrill

OTHER INFORMATION

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