

Variation in Corporate Statistics

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Problem

All data used in FOQA/FDM suffers from variation. In terms of trend statistics based upon event rates over a given period, variation will occur due to statistical noise, and the lower the number of flights, the greater the level of variation.

Analysis

The extent of data variation can be seen in the four diagrams below. In each example, ten samples of random data with an average value of 0.5 are averaged ten times in succession. The scatter and apparent trend lines are simply a result of random variation in the data. These lines do not mean the underlying measurements are increasing or decreasing.

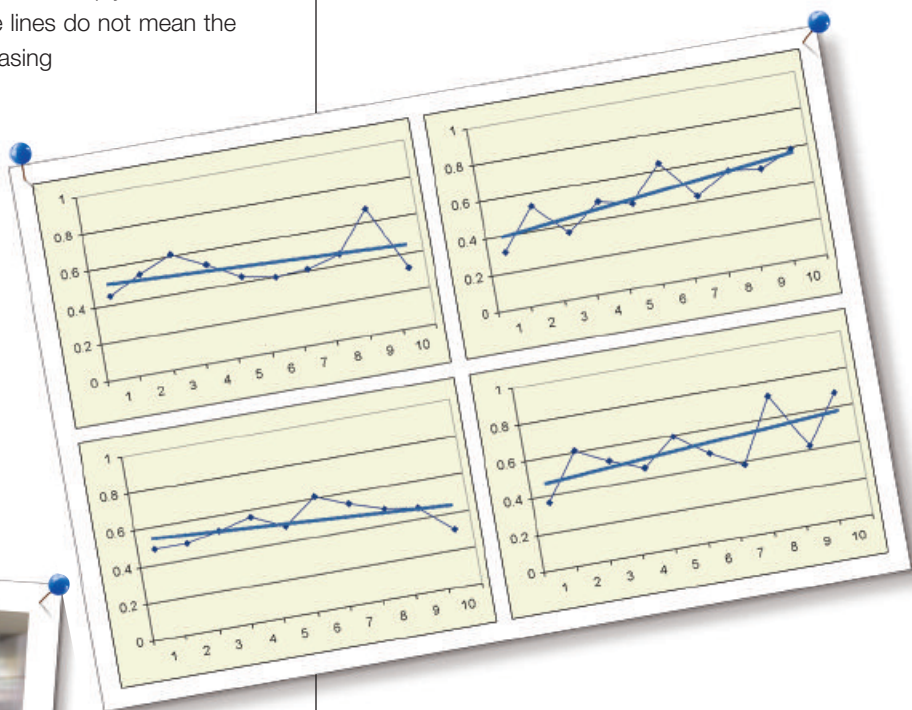
Other operators with low event rates

When an operator has eliminated the causes of all routine patterns of events and maintains an effective monitoring process to ensure no new patterns emerge, the operator is left with only a residual pattern of events.

Variations in random data

If we examine real aircraft data, the variation can be dramatic. The diagram below shows the monitored events for four corporate operators. As these operators fly different types of aircraft you would expect some variation. However, you would expect the number of events arising from flight path deviations (excessive rate of descent when following an ILS approach, for example) to be independent of aircraft type.

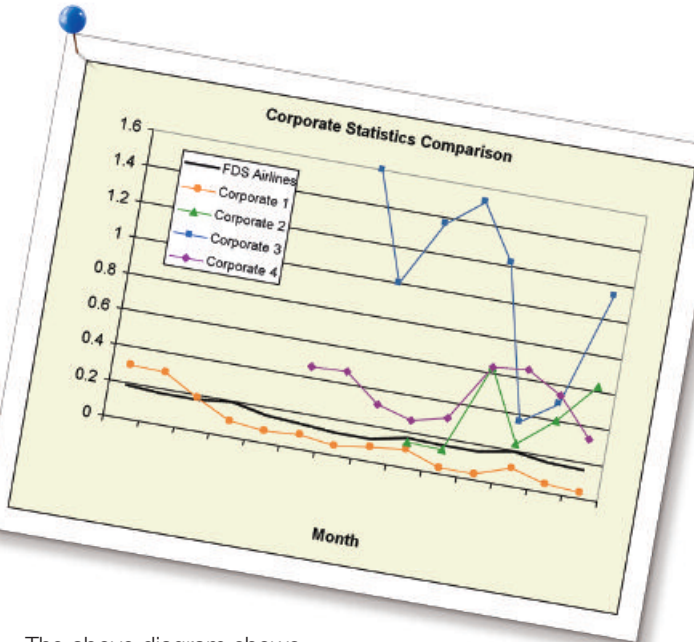
The data for the four operators is shown alongside an average of all the airline data available to Flight Data Services (FDS). This average is based on far more data so the scatter is smaller for this trend.



Variation in Corporate Statistics

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Variation in corporate flight data



The above diagram shows that the scatter for Corporate Operator 1 is remarkably low. This is achieved by flying a large number of routine sectors. After the first three months of FOQA/FDM, Operator 1 achieves a lower event rate per flight than the airlines. The other three corporate operators have much less data per month and hence have a higher scatter.

Discussion

It has been suggested that combining data from different operators would reduce the scatter, but if you were Operator 2, would you want your event rate increased by adding to Operator 3, who started FOQA/FDM with more than 1.5 events per flight? The better way to reduce the scatter is to extend monitoring periods from months to quarters and accept the data will take a little longer to show variations.

If the scatter is left unchanged, the data can still be used. In the diagram on page one, each operator can compare event rates with the other operators to establish to what extent they need to improve flight safety. The data from the other operators then provides a target to work towards. Also, the airline data trend provides an indication of the level you need to achieve to make flying in your corporate jet safer than taking a scheduled ticket.

Benchmarking

FDS provides trend graphs or 'benchmarking charts' like those presented in this document for all its customers. These allow customers to benchmark themselves against other operators and against best in class.

FDS helps customers to identify safety issues in their operation and then achieve measurable reductions in event rate.

How will you improve flight safety in your operation?



Find out more

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