What Is the Monetary Value of Expediting Aircraft Programmed Depot Maintenance?

Every day (or hour) that a commercial airline operates an aircraft, it expects to generate a level of profit. Such a profit-per-day metric can then be used to assess the premium an airline would be willing to pay to get an aircraft through depot-level maintenance more quickly. The U.S. Air Force lacks a profit metric for its aircraft; yet, it faces cost-benefit calculations in its depot maintenance practices. Expediting programmed depot maintenance (PDM) would result in more aircraft being available to units. Would it be worth investing $50,000 to expedite an aircraft's PDM by one month? How about $500,000?

RAND Project AIR FORCE (PAF) has developed a new methodology to calculate the value of expediting PDM. The study uses the fact that the Air Force has chosen to pay for intermittent PDM visits to estimate a defensible lower bound on what expedited PDM would be worth. It then uses F-15 data to illustrate the methodology.

A Simple Valuation of Expedited PDM

PAF's model supposes there must be enough net benefit (total benefit above incremental cost) after completion of a PDM visit to justify the cost of PDM. Fiscal year 2005 Air Force Total Ownership Cost system data suggest that a typical F-15 PDM visit costs about $3.2 million.

There are different aircraft valuation curves consistent with a PDM visit being worthwhile. Assuming that net valuation does not increase as an aircraft ages, the most conservative valuation curve (generating the lowest value of expedited PDM) is a horizontal line. With a horizontal valuation line, the PAF study estimates that expediting an F-15's last PDM visit by one month would be worth about $60,000. A horizontal valuation line also implies that it is preferable to expedite an older, rather than newer, aircraft's PDM visit.

Valuing F-15 PDM Speed with Declining Aircraft Valuation

Aircraft tend to be worth less (adjusting for inflation) as they age. As time passes, potential adversaries obtain new technology that may render an aircraft less effective. Additionally, the aircraft may have declining availability and/or rising maintenance costs with age.

Unfortunately, one does not observe aircraft valuation over time. One does, however, observe aircraft mission capability (MC) and full mission capability (FMC) rates. F-15C/D MC and FMC rates increased substantially in the early months of calendar year 2002, but have otherwise undergone a long-term decline. A declining MC rate as an aircraft ages is consistent with declining aircraft valuation.

PAF incorporated declining aircraft valuation into its PDM acceleration valuation calculation. With a 1.35-percent annual valuation decline rate (consistent with the observed F-15C/D FMC rate of decline), expediting an F-15's last PDM visit is estimated to have a minimum valuation of about $75,000 (up from about $60,000 with constant valuation). More pronouncedly, the estimated value of accelerating earlier PDM visits for newer aircraft increases markedly. For example, the methodology estimates that accelerating a newer F-15's first PDM visit is worth more than $180,000. It is reasonable and intuitive that expediting a newer aircraft's PDM visit is more valuable than expediting an older aircraft's visit.

This study will inform the decisionmaking of Air Force and other Department of Defense maintenance and financial personnel as they weigh the cost of expediting PDM against the benefit of allowing operating commands to possess more aircraft. In particular, this study provides a way to calculate a lower bound on the otherwise hard-to-estimate benefit side of the decisionmaker's calculation. ■

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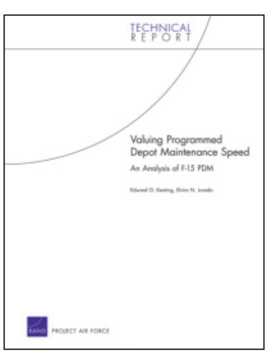

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