

Dynamic Determination of Spare Engine Requirements for Air Fighters Integrating Feedback of Operational Information

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Abstract : Korean air force is undertaking a big project to replace prevailing hundreds of old air fighters such as F-4, F-5, KF-16 etc. The task is to develop and produce domestic fighters equipped with 2 complete-type engines each. A large number of engines, however, will be purchased as products from a foreign engine maker. In addition to the fighters themselves, secure the proper number of spare engines serves a significant role in maintaining combat readiness and effectively managing the national defense budget due to high cost. In this paper, we presented a model dynamically updating spare engine requirements. Currently, the military administration purchases all the fighters, engines, and spare engines at acquisition stage and does not have additional procurement processes during the life cycle, 30-40 years. With the assumption that procurement procedure during the operational stage is established, our model starts from the initial estimate of spare engine requirements based on limited information. The model then performs military missions and repair/maintenance works when necessary. During operation, detailed field information - aircraft repair and test, engine repair, planned maintenance, administration time, transportation pipeline between base, field, and depot etc., - should be considered for actual engine requirements. At the end of each year, the performance measure is recorded and proceeds to next year when it shows higher the threshold set. Otherwise, additional engine(s) will be bought and added to the current system. We repeat the process for the life cycle period and compare the results. The proposed model is seen to generate far better results appropriately adding spare engines thus avoiding possible undesirable situations. Our model may well be applied to future air force military operations.

Keywords : DMSMS, operational availability, METRIC, PRS

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