.

CG BASED DESIGN OPTIMIZATION OF AIRCRAFT DROP TANKS

Krishna Prasad, K. Sooraj Kumar
Aeronautical Development Agency
Ministry of Defence, Vimanapura Post
Bangalore-560 017, India

Abstract

A new method is introduced to locate the partitions in external fuel tanks, a.k.a. drop tanks ofcombat aircraft. Using operational requirements to simplify the fuel transfer sequence, anoptimization algorithm is developed to reduce the variation in aircraft Centre of Gravity (CG).A conservative limit on the CG effect of fuel slosh is introduced. This method results in locatingthe tank partitions such that dynamic effects on CG-variation are minimized. The method canbe generalized and used in the design of any external drop tank. This ab-initio method isdeveloped based on the experience gained in the development of a legacy fighter aircraft fuelsystem.

Keywords: Combat Aircraft, Drop Tanks, Fuel Tank Partition, Centre of Gravity, Slosh