

SUBSTITUTE BIRD OBJECTIVES AND CONSTRAINTS

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Abstract

Wild and farming bird use for bird strike resistance testing is no longer allowable both for philosophical and technical reasons. Bird life must be preserve and it seems that animal use for technical experiment will no more be acceptable to non concerned people. Technically speaking, wild or farming bird use for test representativity reasons is contestable as none of these bird can be representative of real bird strike involved birds. Test repeatability, considered as the most important parameter in ail qualification test, is not accessible with real birds.

Many problems should be solved before using systematically substitute bird in engine and structure bird strike resistance tests. Substitute bird choice should square with well defined and approved mechanical, aerodynamical and geometrical criteria.

Cooperation between BSCE members can be very useful to Civil Aviation Authorities in such a matter.

CEPr conclusions on the substitute bird problem are given at the end of the article.

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CENTRE D'ESSAIS DES PROPULSEURS



SUBSTITUTE BIRD OBJECTIVES AND CONSTRAINTS

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SUMMARY

- * WHY A SUBSTITUTE BIRD IS NEEDED
 - WILD BIRD PROTECTION
 - TEST REPRESENTATIVITY
- * MAIN PROBLEMS TO SOLVE
 - SUBSTITUTE BIRD DEFINITION & DESCRIPTION
 - SUBSTITUTE BIRD CHOICE PROCEDURE
- * KEY CONCLUSIONS



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WHY A SUBSTITUTE BIRD IS NEEDED

* WILD BIRDS PROTECTION

* RESPECT OF LIFE

* TEST REPRESENTATIVITY

* CONCLUSIONS



CENTRE D'ESSAIS DES PROPULSEURS

WHY A SUBSTITUTE BIRD IS NEEDED

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* WILD BIRDS PROTECTION

- PROBLEMS RAISED BY WILD BIRDS USE :

- ==> MOST OF THE SPECIES ARE PROTECTED
- ==> BIRD WEIGHT HARD TO REACH : WEIGHT ADJUSTEMENT OFTEN NEEDED
- ==> QUANTITY AVAILABLE, DELIVERY DELAY, ETC... ARE HAZARDOUS
- ==> BIRDS REPRESENTATIVITY (EX : 4 POUNDS HEARING GULL !)

WILD BIRDS IS NOT AN EASY SOLUTION TO DEAL WITH !



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WHY A SUBSTITUTE BIRD IS NEEDED

* RESPECT OF LIFE

BOTH FARMING BIRDS AND WILD BIRDS ARE LIVING BEING

PEOPLE SENSIBILITY AND TEST REQUIREMENTS ARE BEGINNING TO DIVERGE

BIRDS USE FOR BIRD STRIKE TESTS WILL BE RESTRAINED AND OUTLAWED VERY SOON!



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WHY A SUBSTITUTE BIRD IS NEEDED

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* TEST REPRESENTATIVITY

o TEST REPETABILITY FROM ONE RIG TO AN OTHER

- NO COMPARATIVE TEST POSSIBLE : TEST COST TOO HEAVY

==> VERY FEW DATA AVAILABLE

==> REPETABILITY IS A BASIC ASSUMPTION !



WHY A SUBSTITUTE BIRD IS NEEDED

* TEST REPRESENTATIVITY

o TEST REPETABILITY FROM ONE RIG TO AN OTHER

- MAIN DIFFERENCES

==> BIRD SPECIES CHOSEN

(AERODYNAMIC CHARACTERISTICS, WEIGHT DISTRIBUTION)

==> TIME SPENT BETWEEN BIRD DEATH AND BIRD USE

(INCLUDING DEFROZEN TIME)

==> SHOOTING SYSTEM & BIRD BEHAVIOUR DURING GUN ACCELERATION



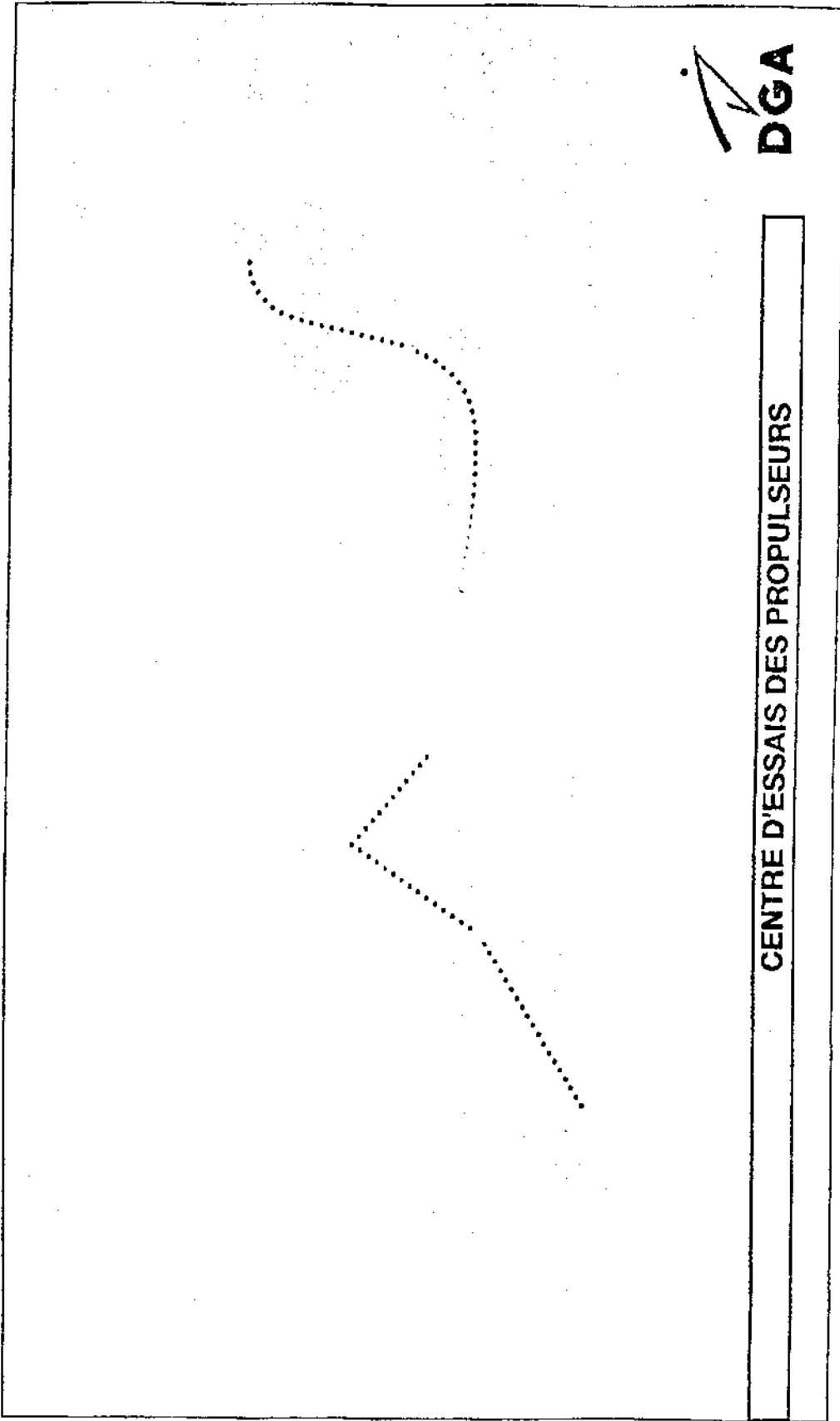
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WHY A SUBSTITUTE BIRD IS NEEDED

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WHY A SUBSTITUTE BIRD IS NEEDED



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WHY A SUBSTITUTE BIRD IS NEEDED

* TEST REPRESENTATIVITY

o TEST REPETABILITY FROM ONE SHOT TO AN OTHER

- BIRD WEIGHT DISPERSION

==> WEIGHT ADJUSTEMENTS ARE OFTEN NECESSARY

- TWO SOURCES OF BIRD TRAJECTORY DISPERSION

==> BIRD WEIGHT DISTRIBUTION DISPERSION
(DENSITY - CENTER OF GRAVITY)

==> BIRD AERODYNAMICAL CHARACTERISTICS



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