Accelerating the future of aerospace

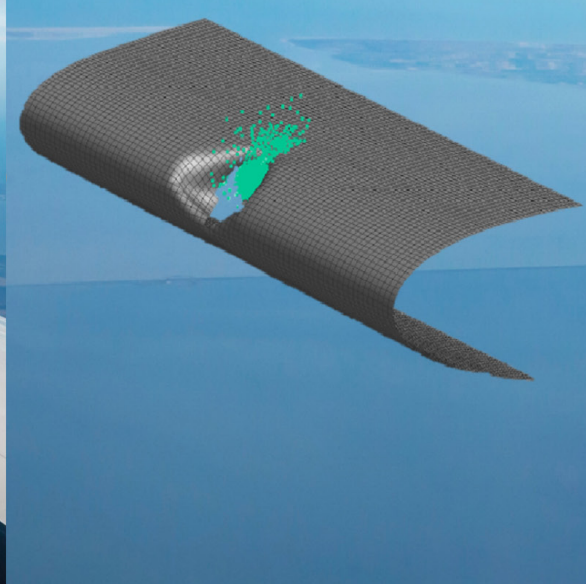
Impact damage predictions and threat analyses

PRODUCTS & SERVICES

Reduce the costs of physical impact tests and improve your threat analyses

Drones are starting to dominate the lower airspace, which increases the chance of impact. Helicopters and aircraft that fly at lower altitudes, UAM and windturbines are not yet designed to account for impact damage from birds, let alone from drones with very different mechanical properties. In the future this might result in new rules that will impose additional requirements on the structure.

Impact models developed by Royal NLR can be used by authorities and industry to analyse different threat scenarios, provide input for possible design changes, and prepare for implications of new certification rules.



WHAT YOU NEED

Impact simulation models and threat analyses to determine the damage caused by collisions.

WHAT WE DELIVER

With the developed models at NLR, further insight in the damage behavior is obtained and expensive impact tests can be reduced.

OUR CAPABILITIES

NLR has experience with the modelling and analysis of:

- Bird strike on an aircraft structure like a leading edge or panel with a validated 4 lb Smoothed Particle Hydrodynamics (SPH) bird model in Abaqus to prove bird strike resistance and show compliance with bird strike regulations;
- (Multiple) Drone impact on leading edge using advanced computational models including SPH and damage mechanics. Results of the simulation are qualitatively compared with test results;
- Frangibility of airport structures like Instrument Landing System (ILS) glide slope towers, Approach Lighting System (ALS) towers, weather station masts and fences to prove frangibility of such airport structures according to frangibility regulation.

PRODUCTS & FEATURES

NLR has advanced damage models for composite and metallic structures. The impactor (drone or bird) is modelled using a mesh free method (SPH). Furthermore, a second modelling approach is chosen for the drone using a lagrangian approach using material non-linearity and damage. User requests can be sent to impact_simulations@nlr.nl

AEROSPACE VEHICLES DIVISION
Collaborative Engineering Systems

+31 88 511 31 13
impact_simulations@nlr.nl

Royal NLR
Anthony Fokkerweg 2
1059 CM Amsterdam • The Netherlands
PO box 90502 • 1006 BM Amsterdam • The Netherlands
info@nlr.nl **www.nlr.org**

Voorsterweg 31
8316 PR Marknesse • The Netherlands
PO box 153 • 8300 AD Emmeloord • The Netherlands
info@nlr.nl **www.nlr.org**

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