

# Experimental testing of helicopter ditching in waves

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## ABSTRACT

The purpose of the present experiment is to evaluate a set of forces, displacements and deformations acting on a helicopter and its floaters during an emergency ditching. The tests are performed at the ocean wave tank of Ecole Centrale de Nantes both in calm water and in waves with a scaling of 1/3.4. The experiment is designed in the framework of the H2020 SARA project. The helicopter is accelerated on a large sliding structure developed for this specific purpose. The mockup consists in several parts, the floaters (two sets of 4: rigid and inflatables), the cabin, a junction piece (which is changed to vary heel, trim, and yaw at impact) and a trolley (which is going down the slider). One instant of impact is presented in Figure 1.



**Figure 1:** Impact of the mockup in waves

At model scale, the helicopter built in aluminium weighs around 350 kg, with a maximum horizontal velocity at impact over  $8 \text{ m.s}^{-1}$  and a maximum wave height tested of 1 m. Measurements are performed through 3 piezoelectric load cells under the fuselage, placed in the front, the middle and the back of the cabin. Additional load cells are dedicated to measure the loads given by the floats on the sponsons and on the cabin, and on the girths linking the floats to the fuselage themselves.

The objectives of the tests are to create a database for the validation of numerical high fidelity CFD codes but also to be as representative as possible of realistic ditching scenario.

## REFERENCES

- [1] Thompson, William C *Ditching Investigation of a Dynamic Model of a HU2K-1 Helicopter*. NASA TM SX-626, 1961.