AVIATION IS AN EVER GROWING MARKET WITH A STRONG DEMAND FOR ROBUST AND SAFE PRODUCT CERTIFICATION. SINCE SEVENTY PERCENT OF THE EARTH’S SURFACE IS COVERED WITH WATER, AN IMPORTANT SAFETY ASPECT IS THE EMERGENCY LANDING ON WATER, SO-CALLED DITCHING. TO SUPPORT THE RELATED COMMISSIONING AND DESIGN NEEDS, A POTENTIAL FLOW BASED SIMULATION METHOD HAS BEEN SUGGESTED IN [1]. THE APPROACH WAS SUBSEQUENTLY REFINED TO COVER VARIOUS EFFECTS LIKE VENTILATION, CAVITATION OR DEEP IMMERSION INFLUENCES.

THE SIMULATION OF A/C LOADS USUALLY FOLLOWS A RIGID BODY ASSUMPTION, WHICH ARE SUBSEQUENTLY IMPOSED ON A DEFORMABLE A/C TO INVESTIGATE THE STRUCTURE RESPONSE. THE PRESENT STUDY IS DEVOTED TO AN INVESTIGATION OF LOAD CHANGES INDUCED BY A DEFORMATION OF THE FUSELAGE STRUCTURE. TO INVESTIGATE THE TWO-WAY FSI-COUPLING, A PARTITIONED FINITE VOLUME METHOD (FVM) / FINITE ELEMENT METHOD (FEM) [2] IS USED.

FOLLOWING A VALIDATION OF THE PROCEDURE, AN APPLICATION OF A GENERIC FUSELAGE SECTION IMPACTING ON A FREE WATER SURFACE WITH A VERTICAL SPEED OF 1.5 m/s IS PRESENTED. THE HYDRODYNAMIC LOADS ARE COMPARED TO THE IMPACT OF THE SAME BUT RIGID FUSELAGE SECTION.

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REFERENCES
