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MODELING AND SIMULATION OF SHIPBOARD LAUNCH AND RECOVERY OF HELICOPTERS – AN OVERVIEW OF AVT-315

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Abstract

AVT-315 is a NATO Research Technology Group comprised of five NATO member nations, plus Australia. The title of the project is 'Comparative Assessment of Modeling and Simulation Methods of Shipboard Launch and Recovery of Helicopters'. This technical paper will present the background to the project and its aims and objectives. The project is nearing completion so the paper will also present an overview of the research that has been conducted, along with a selection of results.

There has been a considerable international research effort for many years into understanding, modelling and simulating the helicopter-ship dynamic interface (HSDI); i.e. the flying environment around the landing deck of a ship in which a maritime helicopter will operate. The research has been aimed at developing a better understanding of the dynamic interface, the modelling of the ship airwake, and the modelling of a helicopter operating in that environment. While much of this research has been conducted by organisations from various NATO member countries, it has been difficult to compare the different M&S methods because each nation operates different ships and helicopters. Therefore, to align the national methods, a common ship has been created, the NATO Generic Destroyer, or NATO-GD, along with a common helicopter, the NATO Generic Rotorcraft, or NATO-GR.

An essential component for simulating the HSDI is the air flow over the ship, i.e. the ship 'airwake'. Members of AVT-315 have applied their own CFD methods to creating the airwakes for the NATO-GD and, for the first time, this has been done with the ship having realistic motion in pitch, roll and heave. Another original contribution has been the provision of experimental data from wind-tunnel measurements where the model NATO-GD was moving with the same realistic motion profiles.

The capstone event for AVT-315 was to implement the airwakes in a full motion flight simulator where a team of test pilots flew the NATO-GR to the deck of the NATO-GD in challenging wind and sea conditions. The paper will present a selection of key findings from the simulated flight trials.