



Dedicated to innovation in aerospace

AEROSPACE VEHICLES DIVISION

HELICOPTERS AND AEROACOUSTICS

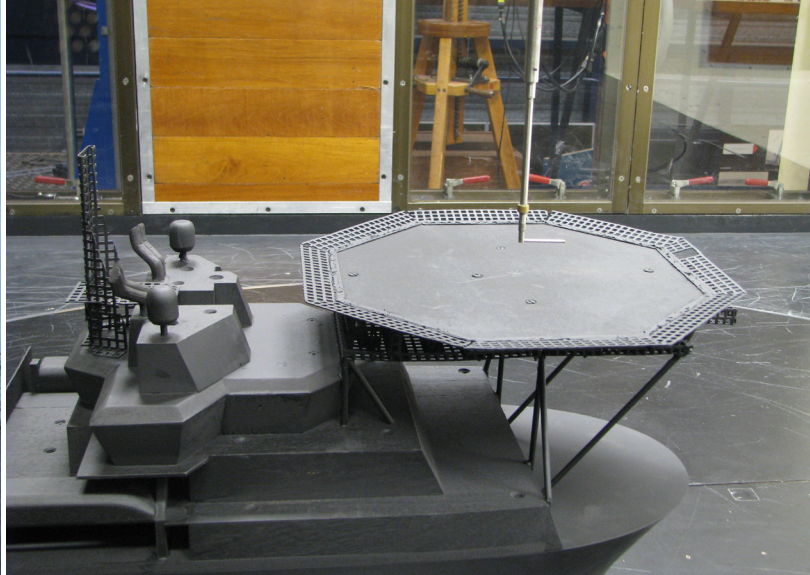
Integration of aviation facilities in ship designs

PRODUCTS & SERVICES



NLR offers support to optimize a ship design for helicopter operations

Integration of facilities for helicopter operations can have a large impact on the design of a civil or military ship. The airflow characteristics around a civil helideck have to meet requirements given in aviation regulations. To ensure safe operations, on-board testing of aviation facilities is usually required. NLR can support integration of aviation facilities in a ship design, execute an aerodynamic investigation and execute full scale testing of aviation systems on board a ship.



WHAT YOU NEED

- Integrate helideck and aviation facilities in a ship design?
- Ensure compliance to civil and military aviation regulations?
- Optimize the airflow and minimize exhaust gas nuisance above a helicopter flight deck?
- Testing of ship systems required for helicopter operations?

WHAT WE DELIVER

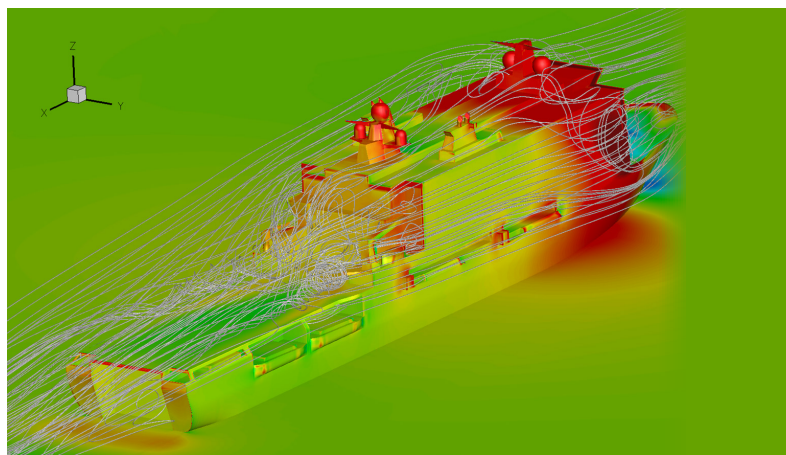
Based on more than 50 years of experience on helicopter-ship interface aspects, NLR can deliver support in a wide range of programmes ranging from design consultancy to full management of test campaigns in the wind tunnel and on board ships.

OUR CAPABILITIES

NLR provides support to integrate aviation facilities in the design stage of the ship such as the sizing of the flight deck and the location of aviation facilities. We use our database "SAFEguide", containing international civil and military aviation regulations. NLR executes an aerodynamic investigation of the ship design either by tests in a wind tunnel or by execution of CFD calculations to obtain data on:

- Wind loads on the ship superstructure or water loads on the underwater structure;
 - Exhaust gas dispersion characteristics ?
 - Pollution at discrete locations ?
 - Air temperature increase cause by exhaust gases of the ship*
 - Airflow around ship: ?
 - Detailed data on airflow around ship for helicopter operations ?
 - Detailed airflow characteristics at ship anemometer positions ?
 - Turbulence intensity as required by civil aviation regulations
- Based on these results, NLR can assist to optimize funnel- or superstructure design of the ship. NLR executes full scale tests of ship systems for helicopter operations:

- Validation of wind measuring systems, whereby airflow data at their positions, obtained in the wind tunnel, are used as reference.
- Helicopter traversing systems: load qualification measurements on helicopter interfaces as function of ship motions to establish an operational envelope.
- Friction tests with a helicopter tyre on flight deck surface material, using a dedicated test rig. Related helicopter-ship interface activities executed by NLR are
- Helicopter-ship qualification innovative training
- Helicopter-ship qualification testing



PRODUCTS & FEATURES

- Design support to integrate helicopter facilities into a ship
- Regulations database SAFEguide to assist with verification and certification
- Aerodynamic investigation by wind tunnel testing and CFD calculations
- Full scale testing of ship systems for helicopter operations