DSC 2071

Supporting ship-helicopter operations

Australian Defence Force (ADF) helicopters play a significant role in peace-keeping and disaster relief operations around the world. The ADF has recently acquired several new helicopter types and is looking to operate them on board Navy's new amphibious Landing Helicopter Dock (LHD) ships.

Operating a helicopter on-board a surface ship is a complex task that requires rigorous engineering analyses and prudent operational procedures. It is affected by a number of factors: wind condition, turbulence on the flight deck, ship motion, helicopter control limits, pilot workload, slung load dynamics and night operations.

DST's Helicopter System Effectiveness team is undertaking research aimed at reducing risk and increasing capability of ADF helicopter operations in challenging environments, including:

- Flight dynamic modelling to develop, verify and validate helicopter flight dynamic models to support a variety of research activities for the ADF
- Simulation model fidelity to assess and improve the fidelity of rotary wing models used in DST's simulator and human-in-the-loop research
- Ship airwake modelling to study turbulence on the flight deck and identify flow structures that may adversely impact on helicopter-ship operations
- Risk reduction analysis to identify critical wind conditions and risks associated with helicopter launch and recovery on-board ships
- Blade sail analysis to establish Ship-Helicopter Operating Limits for rotor start-up and shut-down operations on-board ships
- Concurrent operation analysis to enhance multiple aircraft operations on-board LHD ship
- Accident investigation to provide support to rotary wing accident investigations to help understand events and conditions leading up to an accident
- Slung-load modelling to assess risks associated with flight and vertical replenishment operations under various wind and sea-state conditions
- Unmanned Aerial Vehicle (UAV) control to develop control systems for rotary wing UAVs operating in complex environments
- On-deck analysis to assess risks of helicopter sliding and toppling on flight deck
- On-deck lighting and night vision research to support night operations

Partnering opportunities

DST is seeking industry and academic partners to apply cutting edge technology to assist with ship-helicopter and slung-load operation.

For more information contact:
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