

# NAVY Transition Assistance Program

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N07-031 - Continuum Dynamics, Inc.

## Innovative Rotorcraft/Ship Environment Suppression for Enhanced DI Flight Control

### NEED & CUSTOMER REQUIREMENT

**Need:** Rotorcraft flight operations in the shipboard environment, called the Dynamic Interface (DI), is extremely challenging due to the motion of the ship deck and the surrounding turbulent ship airwake. Advanced flight control systems may help support these difficult DI launch and recovery operations for both manned and UAV rotorcraft.

**Value to the Warfighter:** Safer and more controlled flight profiles to and from aviation capable ship decks would enhance the capability of these aircraft, allowing for a wider range of ship and environmental conditions for flight operations.

**Operational Gap:** Current flight control systems still rely heavily on pilot inputs to mitigate effects of airwake disturbed on the aircraft, and give no quantitative adjustments based on deck motion parameters.

**Customer Specifications:** The Navy wishes to define innovative control algorithms that can accommodate various levels of ship airwake turbulence and ship motion present during DI operations.

**Technology Description:** This control system approach blends on-blade rotor state sensing with uplinked ship motion data to provide both feedback and feedforward controller inputs that can mitigate and suppress many effects of environmental disturbances on both the airframe and the ship deck.

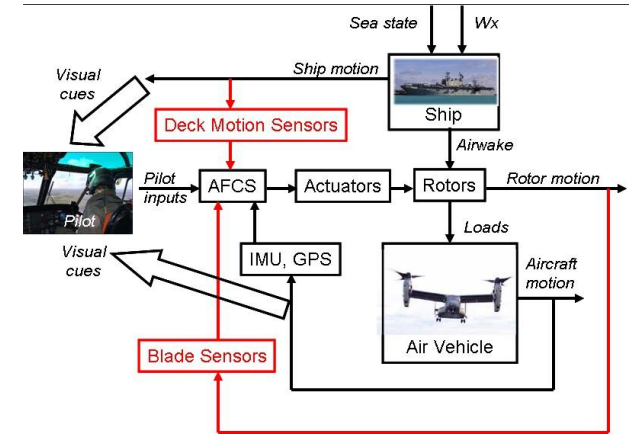
### SPONSORSHIP of original SBIR/STTR Topic

**SYSCOM:** NAVAIR

**Transition Target:** PMA-275 (V-22), PMA-266 (Tactical Multi-Mission UAS)

**Original Sponsoring Program:** PMA-275 (V-22)

**TPOC Phone Number:** 301-342-1382



### TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Develop component simulations	3	Low	Completed component technology simulations	11/3/2007
Validate component simulations	3	Low	validated simulation	11/23/2008
Conduct simulations	4	Low	Validated simulation	
Test simulations in wind tunnel	5	Moderate	Conducted wind tunnel model test	

**Open contract:** N68335-08-C-0408 ending 9/16/2010

### TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

#### Other Potential Applications:

MQ-8B Control System Upgrades (some analysis work with NGC already completed under separate contract)  
V-22 Control System Improvements

#### Business Model:

Support transition of technology through teamed efforts with primes associated with specific vehicle program.

#### Objective:

Primes would partner with CDI for providing technology improvement to support enhanced Navy DI operations. Navy PMAs would request this technology enhancement from the primes to better utilize their aviation asset.