

# Commercializing Ship Research via the “Decisive Demonstrator”

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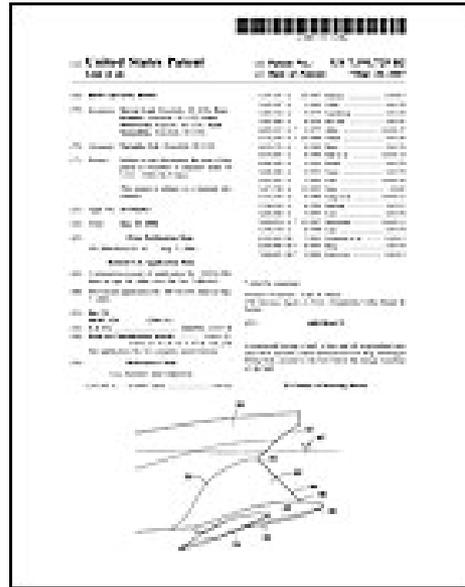


**1970:** Ferro-cement sport fisher



**2010:** Bladerunner-BR 51

**Advanced Technology**



22 U.S. and Foreign patents

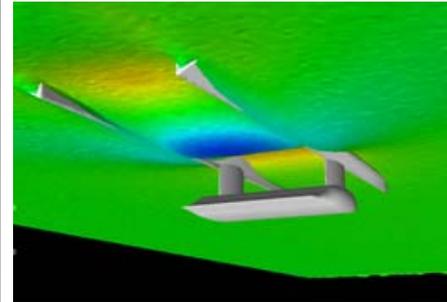


The Royal Institution of Naval Architects

International Reputation Within Field



Superior Design and Optimization Tools



**Rapid Prototyping**

Shipyard to Build Demonstrators



Ideal Test Conditions

**At-Sea Validation**



**Strategic Partnerships**



LOCKHEED MARTIN



NORTHROP GRUMMAN





*Navatek ETM® Inflatable  
vs. Industry Benchmark*

Def. “**Settling or ending something such as a debate, controversy, or contest.**”

**Hawaii is Ideal Test Grounds:**  
varied sea conditions to validate performance (deep, open ocean, coastal, sheltered bays and lagoons)

## **Effective but Expensive**

## **Requires Strategy to Secure Capital**

- Company internal funds
- Investor funds
- Prototyping contracts

# X-Craft

- **Concept Validation**



## Demonstrator Purpose

Resolve science and engineering first principles

*Navatek Midfoil lifting body ship*



# Y-Craft

- **Technology Validation**

SWATH Navatek I



## Demonstrator Purpose

- Tech Transferability
  - Predictability
  - Acceptability
- Maintainability
  - Functionality
  - Style-ability



Navatek II



Kilo Moana (UH)



Damen SWATH Ferry (Holland)

# Justifying the Risk/Cost of Demonstrator

**EASY:**  
Navatek BR-51

Performance gap well-identified

BR-51 technology offers clearly superior performance

Large market size, lack of competition

Intellectual property (IP) protection



**Navatek Bladerunner 51**  
Air Entrapment Monohull



**Fabio Buzzi 55 SC**  
Deep-V Hull

VS.

**Higher Fineness Ratio = Higher Speed Efficiency, Better Seakeeping**

(Fineness Ratio: Length divided by running beam measured at hull chine)



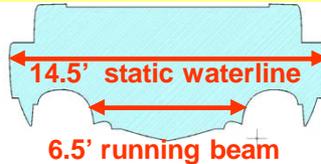
Length 51' divided by running beam 6.5' = **7.84**



Length 54' divided by running beam 9' = 6.0

VS.

**Wider Beam at Rest = Higher Weight Carrying, Better Static Stability**

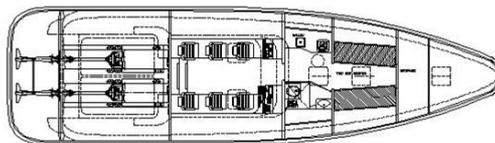


VS.



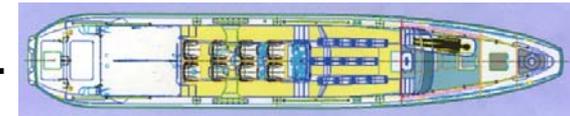
9' static waterline/running beam

**Wider Beam Overall = More Usable Deck Space**



14.5' Beam X 51' Length = **740 sf.**

VS.



9' Beam X 54' Length = 486 sf.

# Justifying the Risk/Cost of Demonstrator

**HARD:**

**HYSWAC/Sea Flyer**

Alternative ways to verify the S&T issues?

- Computer validation?
- Small-scale testing?

Technology synergies? e.g. ability to test advanced polymer drag reduction

U.S. Navy *Sea Flyer* Large-Scale Lifting Body Demonstrator



**“Communicate your value statement clearly and concisely”**

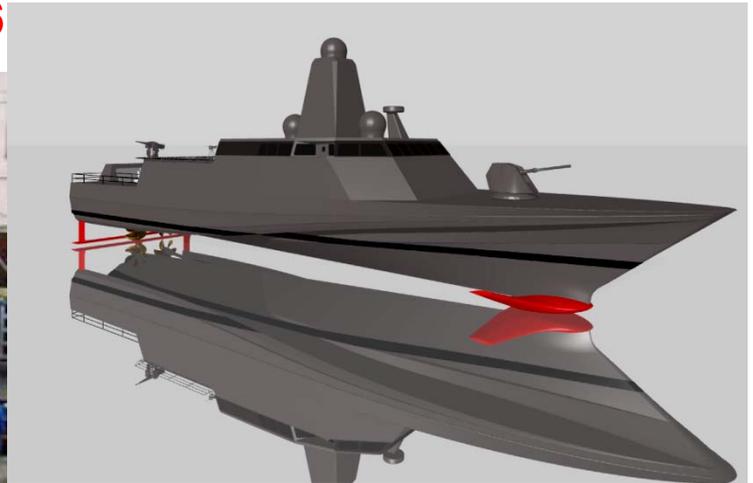
**Vertical Acceleration**  
~.17 grms

	<b>BLB-65</b>	<b>BLB-200</b>
$\lambda$		3.100
Length (m)	19.82	61.44
WL (m)	18.90	58.37
Disp (tonnes)	26.42	787
Speed (knots)	<b>23</b>	<b>40.5</b>
Froude No.(WL)	0.870	0.872
Wave ht.(m)	<b>2.012</b>	<b>6.2</b>
wave period (sec)	5	8.8
wave length (m)	39.0	121.0
wave vel. (m/sec)	7.80	12
Encounter period (sec)	1.99	3.66

*BLB-65 Seakeeping Demo*



**Sea State 6**



**Initial technology transition overseas often easier/effective/appropriate**



**Bladerunner-51 Sets Round-Britain Speed Record: 1,691 miles in 27 hours and ten minutes (62 mph average), beats prior record by almost 4 hours**



**BR-51 TIMELINE**

**2005:** Prototype sets Round-Britain Record, **international commercialization** started

**2006-2009:** **U.S. patent lawsuit** disrupts marketing

**2010:** **Patent lawsuit won;** all appeals against decision are dismissed

**2010:** Prototype retrofitted with Navatek patented ride enhancement system (ARES) for **Singapore** demonstrations

Use Technology Insertion to extend useful life/value of demonstrator

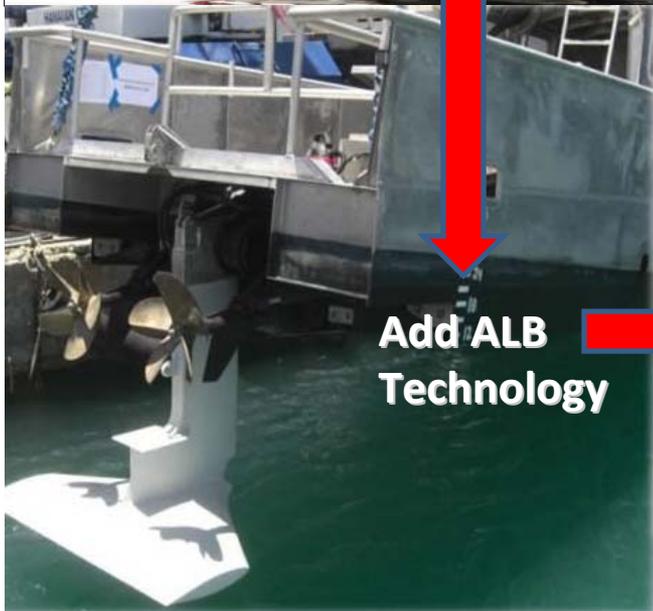
**Navatek ETM<sup>®</sup> 11m demonstrator**



**U.S. Navy 11m ASW USV**

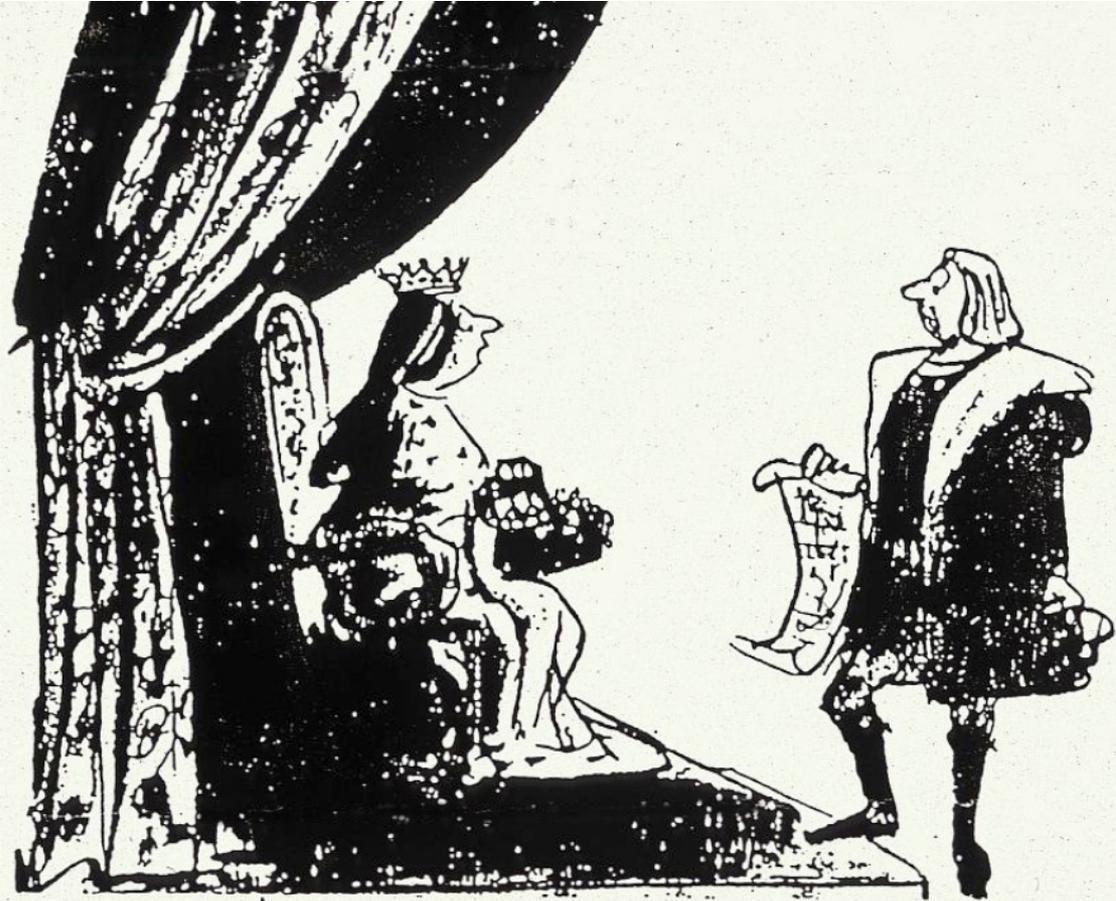


**Navy SBIR**



**Add ALB  
Technology**





*“Three ships is a lot of ships. Why can’t you prove the world is round with one ship?”*

***Innovate, Persevere...and Don't Run Out of Funding!***