



Stiletto / Wolf PAC



Office of Force Transformation

The small...

The fast...

and the many....

Technical Exploration
Operational Experimentation
Industrial Expansion

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Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2006	2. REPORT TYPE		3. DATES COVERED 00-00-2006 to 00-00-2006		
4. TITLE AND SUBTITLE Stiletto/Wolf PAC. The small...The fast... and the many...			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Office of Force Transformation,1000 Defense Pentagon Room 3A287,Washington,DC,20301-1000			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 42	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Assuring U.S. Security

...OFT's Objectives



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- **The U.S. must have access to remote but populous regions of the globe to guarantee our freedom.**
 - *U.S. Security is not assured by protecting only our Nation's borders.*
Secure strategic access and retain global freedom of action.
- Donald H. Rumsfeld, National Defense Strategy, 01 March 2005*
- 1. That security requires development of smaller, faster, more adaptive vessels for effective engagement of an allusive adversary.**
 - 2. Making these systems work will require a new operational and technological Command & Control approach to warfare.**
 - 3. Most importantly, To develop these new, reconfigurable vessels and forces requires an industrial base able to produce them.**



Increase Learning Rates



Mitigate risk w/ numbers, decrease time to market

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- ***Technical Exploration*** – *new materials & hull forms*
 - ***Broaden seaborne options and capabilities***
 - Reduce crew injury
 - *Improve ride quality*
 - Lower operating costs
 - *Operational & Commercial Viability w/ composite materials*
 - Increase high-speed performance and payload fraction
 - Decrease draft / wake & fully characterize performance
 - Explore new methods of production with composite materials
 - Create new analytic tools to evaluate, validate & improve designs
 - *Generate useful Computational (CFD) models to advance new designs*



Assure Access to the Littoral *Operational Maneuver from the Sea*



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- **Operational Experimentation** – *employment options from the Sea*
 - **Dedicated** to Distributed Naval Forces and USSOCOM for...
 - **Mobility** – *High Speed / high payload fraction / low draft-wake-signature*
 - **Insertion** – *In close engagement, greater speed of maneuver*
 - **Sustainment** – *Organic supply and local control at relevant scale*
 - **Reconfigurable** for changing roles & dynamic conditions
 - *Disaster Relief / Humanitarian Assistance (Katrina / Indonesia)?*
 - **Executable** example of a strategic approach to cost for DoD
 - *Reduced cost and time – pairing new CONOPS with technologies*
 - *Compete at scale – fill every niche – cost imposing strategy on adversaries*



National Competitive Advantage

Coherent Strategy for Shipbuilding



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- **Industrial Expansion** – *New competencies / Commercial relevance*
 - **Expand the Industrial Base** – *new materials, production and manufacturing methods*
 - *Catalyze* public – private partnerships: between Government, Industry and Academic
 - *Team* with diverse partners and leverage advances abroad: U.S. is no longer a leader
 - **Advance Distributed Logistical Capabilities** – *Dual-Use Short Sea Shipping assets*
 - *Develop*, design & produce modular, lightweight, high-speed composite vessels
 - **Create American Global Competence** – *incentives for a competitive industrial base*
 - *Build* high numbers of composite surrogates in DoD – *Lowers commercial and financial risk*
 - *Invest* in education – *Retain young government talent by funding MS and PhDs degrees*
 - *Reinvigorate* R&D – *design advanced hull forms with complex composite materials*
 - *Evolve* the “Electronic Keel” – *for commercial and multi-use modular vessels*



Stiletto / Wolf PAC



Concept to Operational Capability in 18 Months

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- **Stiletto – High-Speed, Carbon Reinforced Fiber Craft**
 - *Designed to explore the scalability of non-mechanical dynamic lift, composite construction and high-speed performance for military operations*
 - *Not meant to replace or compete with capital ships of the line, Intended to create capital potential in every networked hull*
- **Wolf PAC – Command & Control of Distributed Operations**
 - *Technological and operational means to command & control large numbers of networked unmanned systems (>50) geographically dispersed*
- **Electronic Keel – Maritime Data Bus**
 - *Facilitate rapid mission/payload reconfiguration necessary for SOF-like forces to deploy, modify and tailor capabilities to emerging challenges*

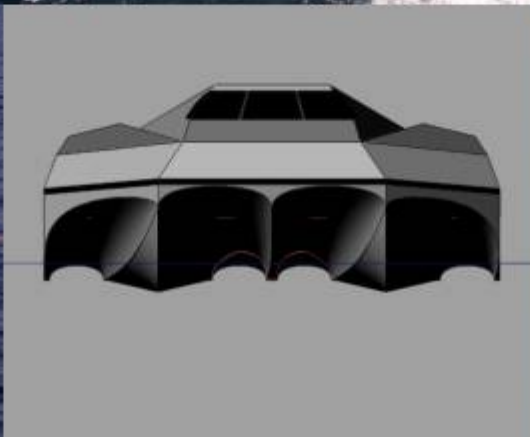


Stiletto (M-Ship Co)

...Surrogate for Change



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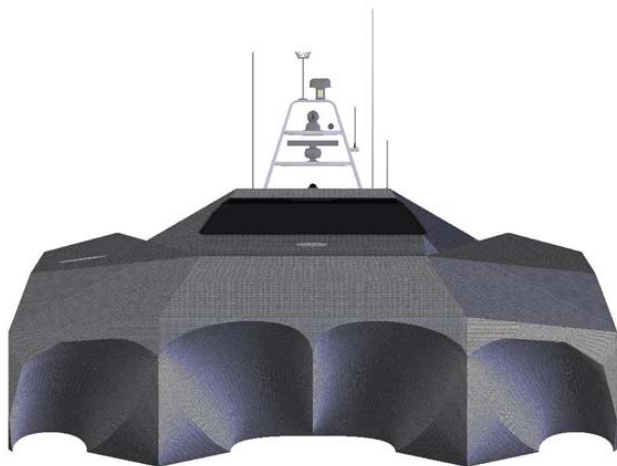
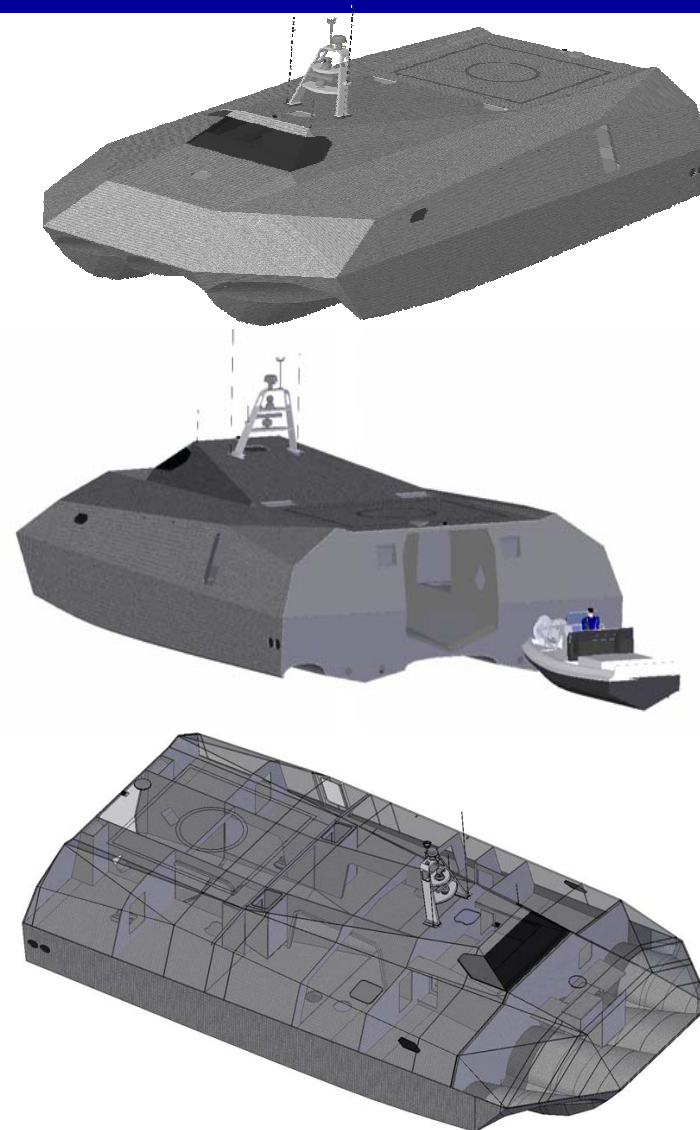
Stiletto



...Technical Objectives

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- Dimensions: 88.6 x 40 ft / Draft 2.5 ft
- Manning: 15 (3 Crew / 12 Passengers w/ SPECWAR Load out)
- Displacement: 60 LT Full Load / 67 LT Max load
- Payload: Cargo - 15 MT / Fuel - 16 MT / Area - 2000 sq ft
- Max Speed: 50-55 kts - SS0 / Cruise Speed 40 kts - SS4
- Range: 500 nm @ full load / max speed
- Reduced crew shock (30-50%) / Improved Sea keeping
- Carbon Reinforced Fiber construction (largest US built)
- 11m RHIB launch & retrieval (up to SS3)
- UAV / USV / UUV launch, retrieval & C2
- Reduced Wake & Drag / Non Mechanical Dynamic Lift Hull
- Networked node for austere environments / disaster relief





Stiletto

...Under Construction



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M Ship Co.

LOA	88'-0"
Beam	40'-0"
Draft (static)	2'-4"
Displacement	60 LT
Payload	15 MT
Fuel Load	17 MT
Classification	ABS
Main Engines	4 x 1650HP C-30 CAT
Surface Piercing Propellers	4
Speed Max @ full load	50-55 knots
Range @ full load & max speed	500 NM
HP Total	6200hp
Clear Height	15'-0"
Payloads	43% of Displacement
11-M RIB or equivalent	
UAV / UUV / USV	
15 personnel (3 Crew / 12 Passengers)	





Stiletto

...SPRINT Panel Construction



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...Bulkheads & Internal Structure



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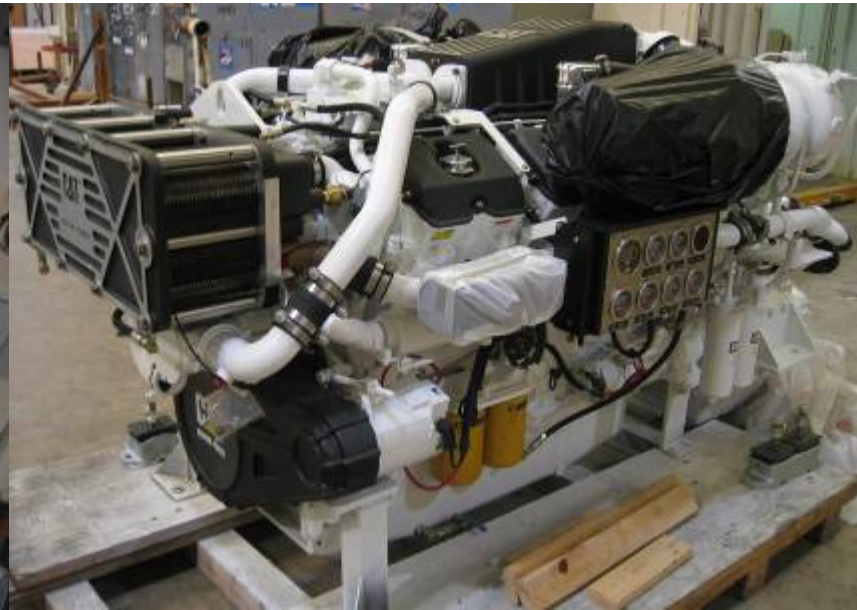


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...Engine Room x 4

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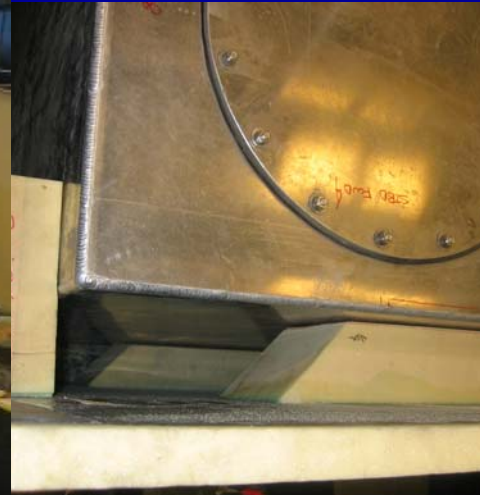


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...Fuel Tank Installation



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...Arneson Surface Drives



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...Superstructure



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...Superstructure

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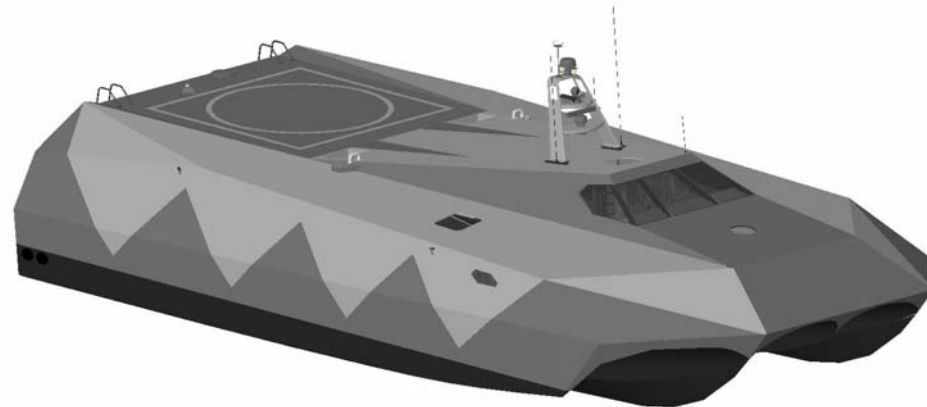
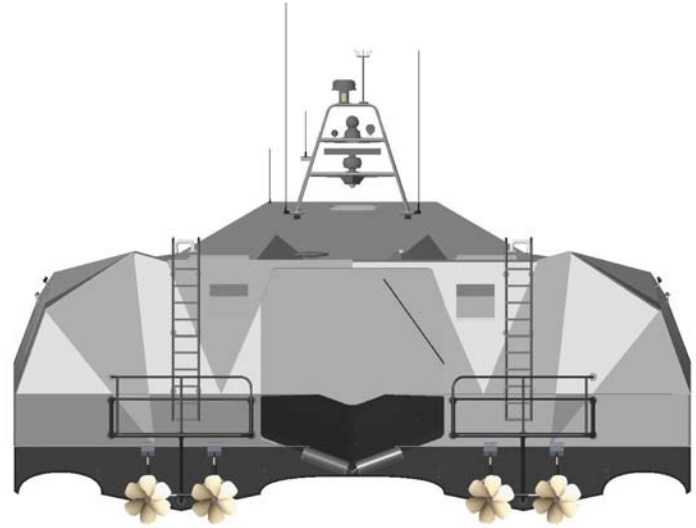
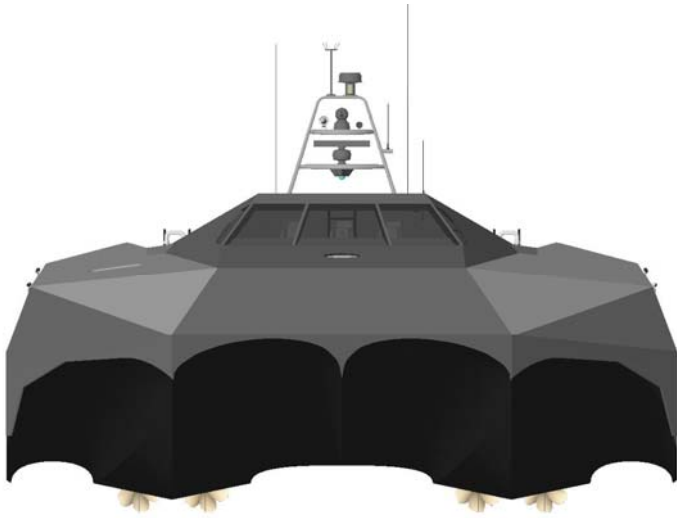


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...Profiles

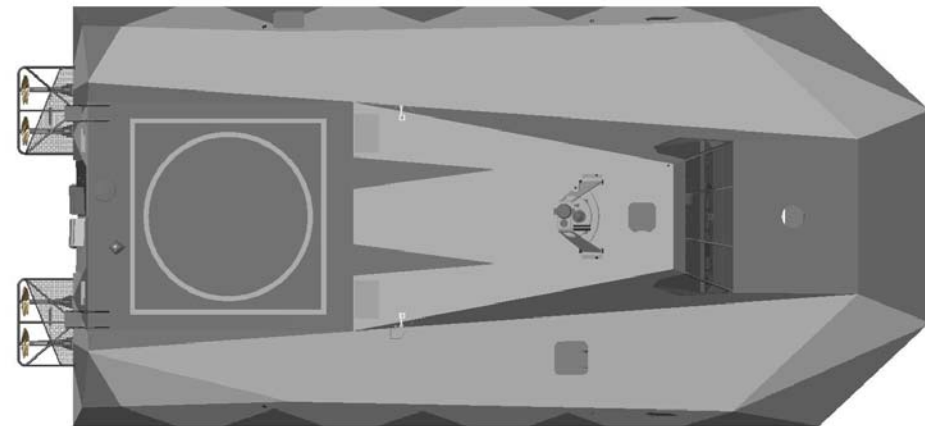
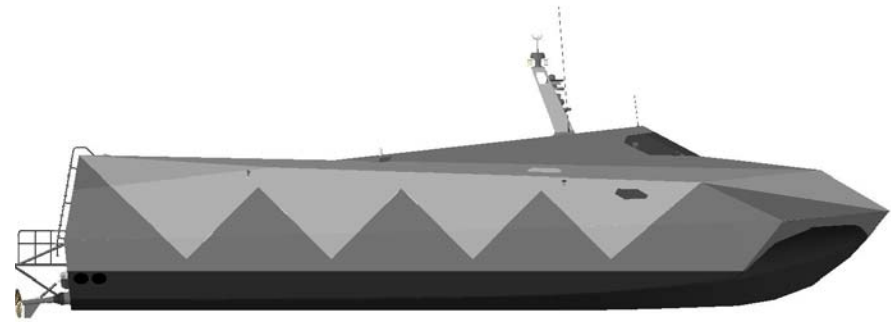
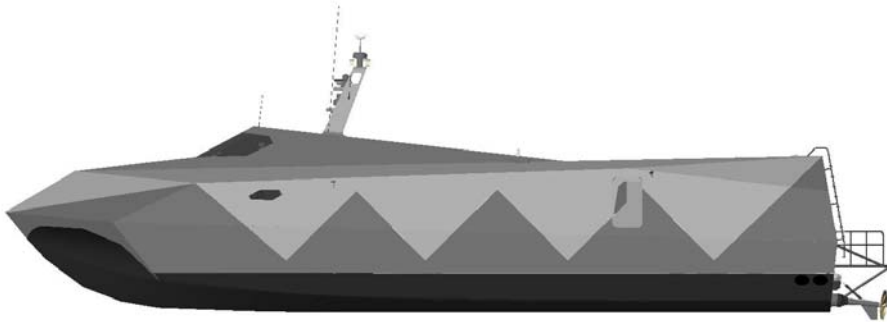
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...Profiles



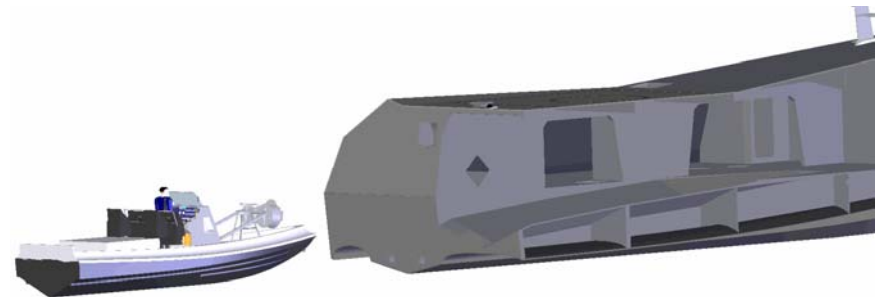
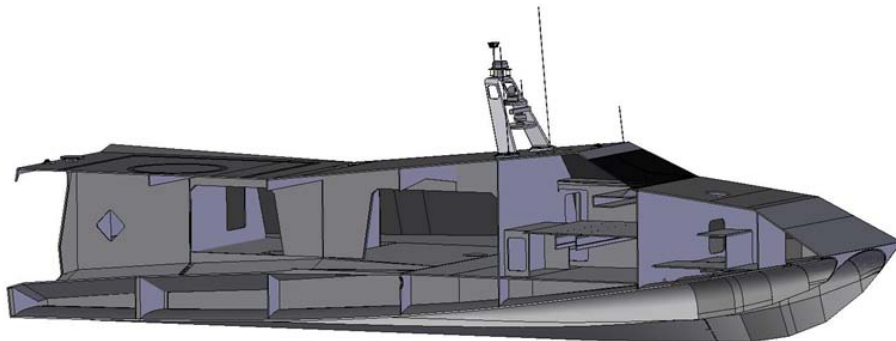
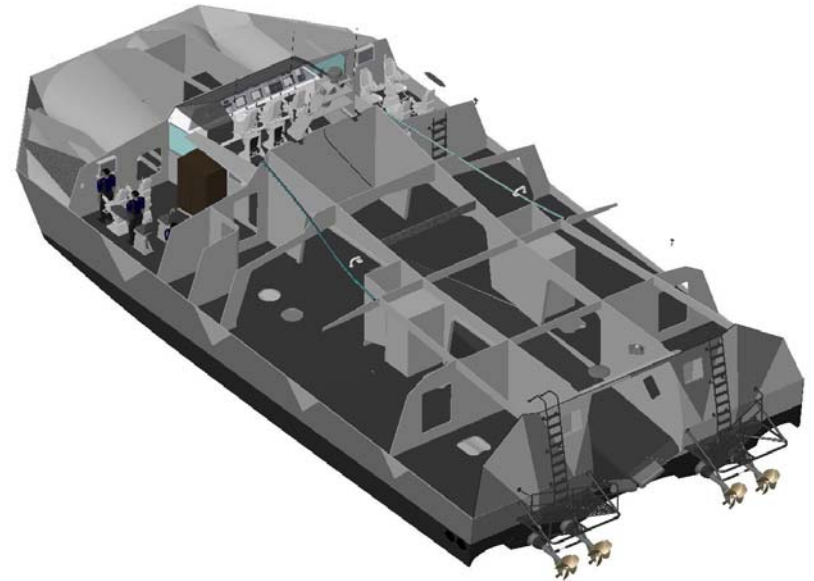
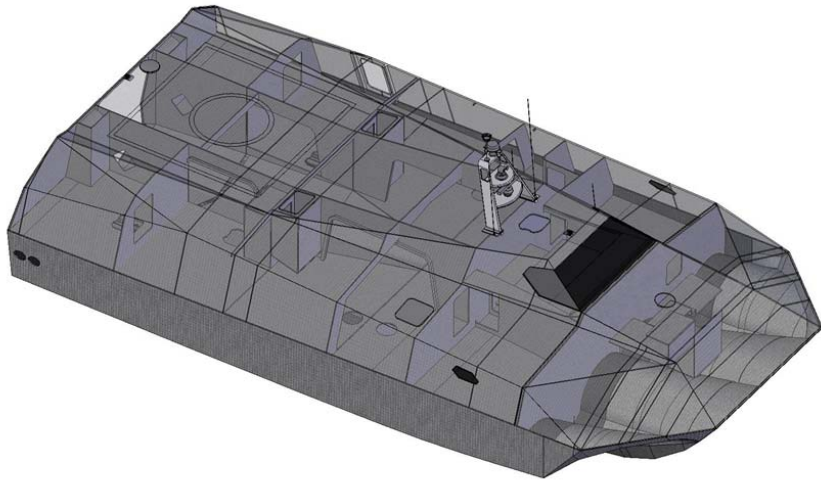


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...Sectional Views

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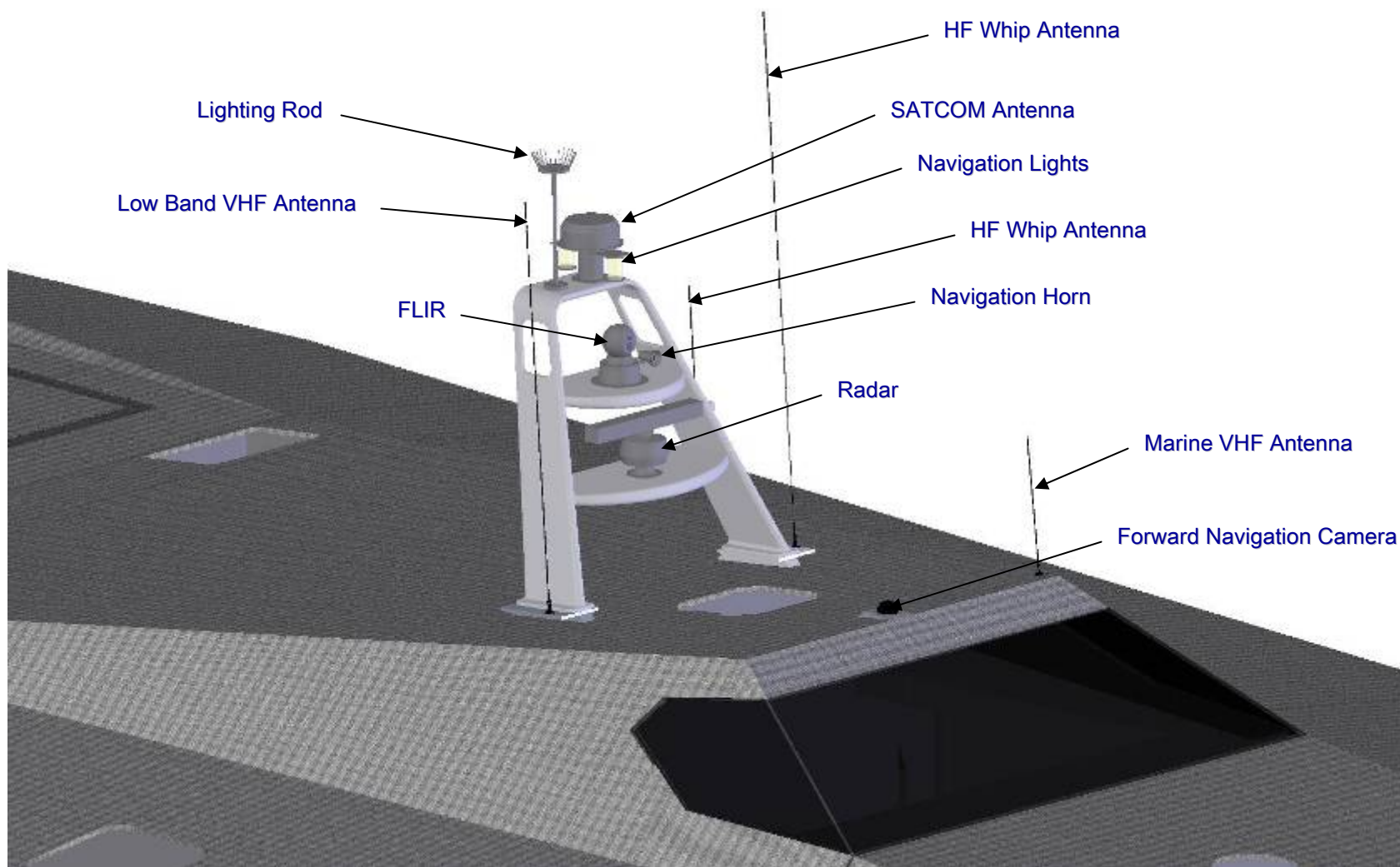


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...ISR Assets



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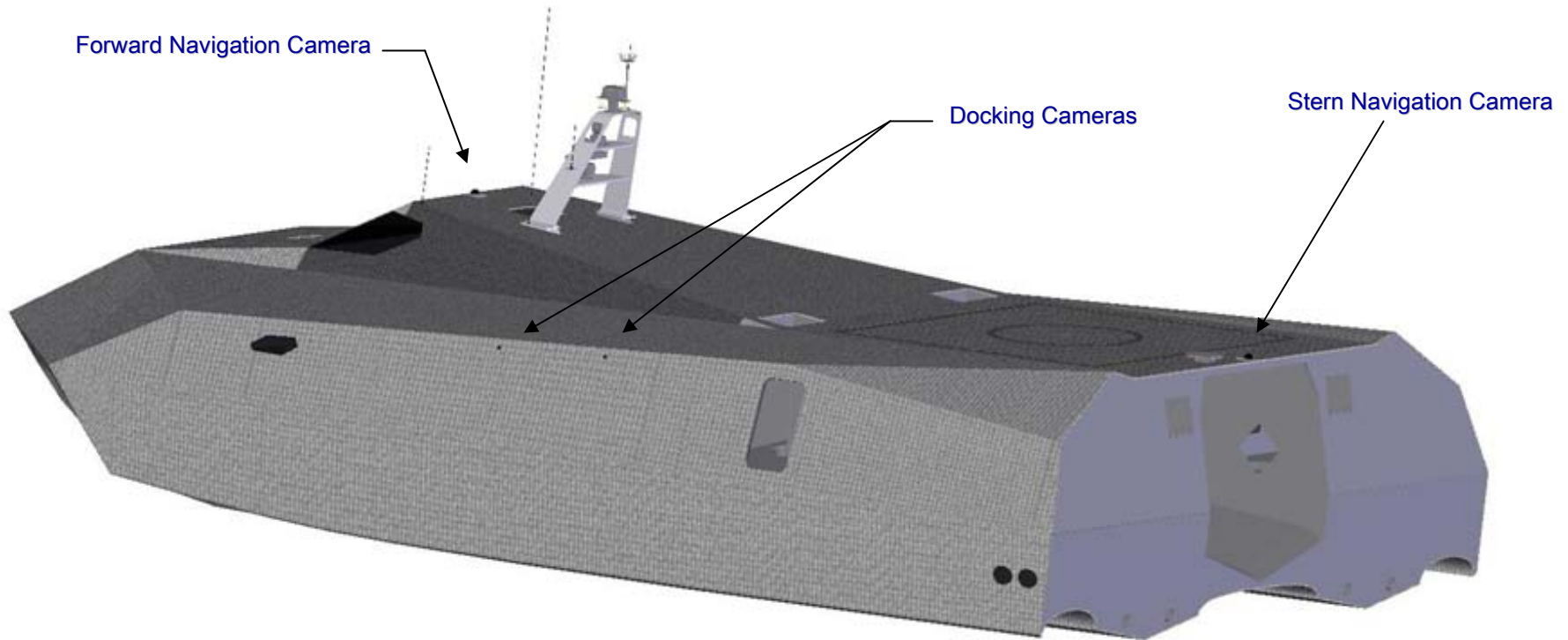


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...ISR Assets



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*** Note: Additional Camera In Payload Area Looking Out Stern

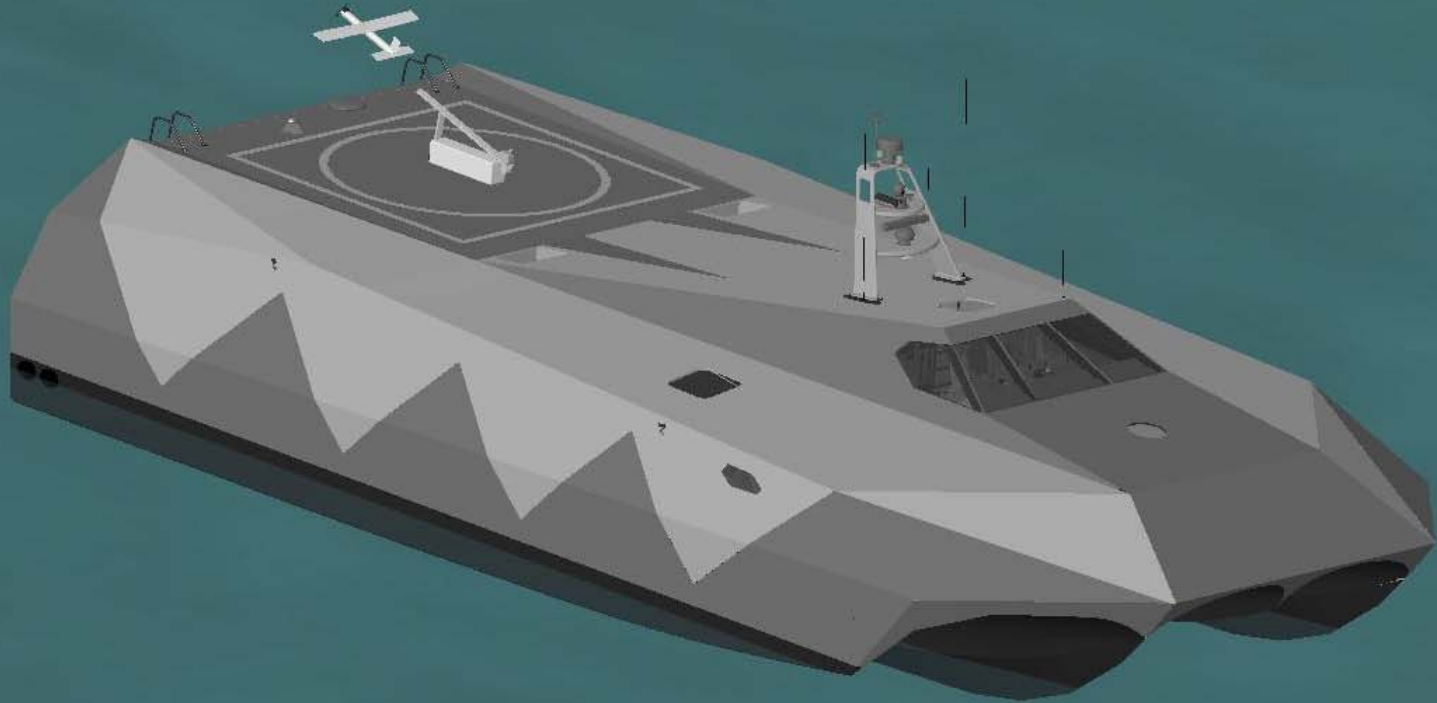


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...UAV Launch & Retrieval



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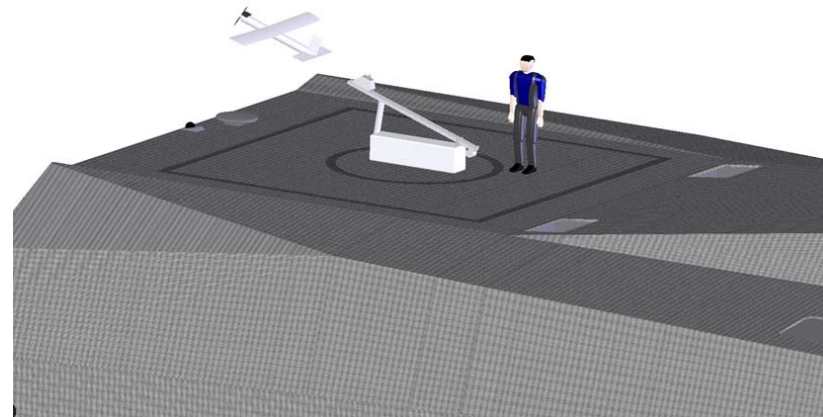
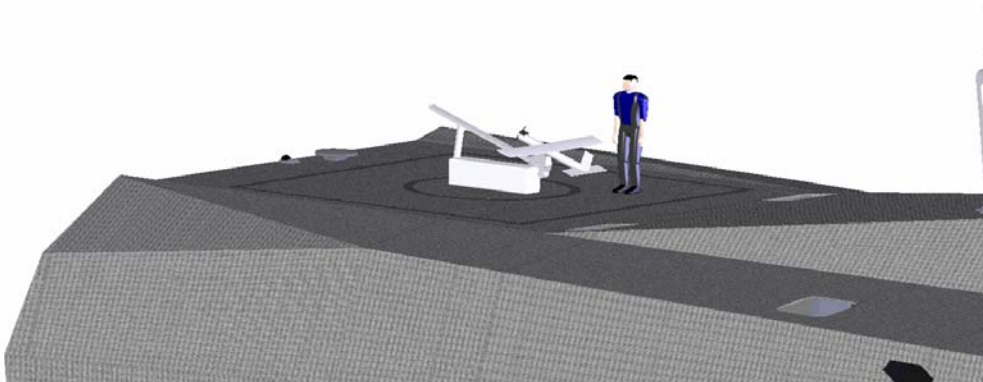
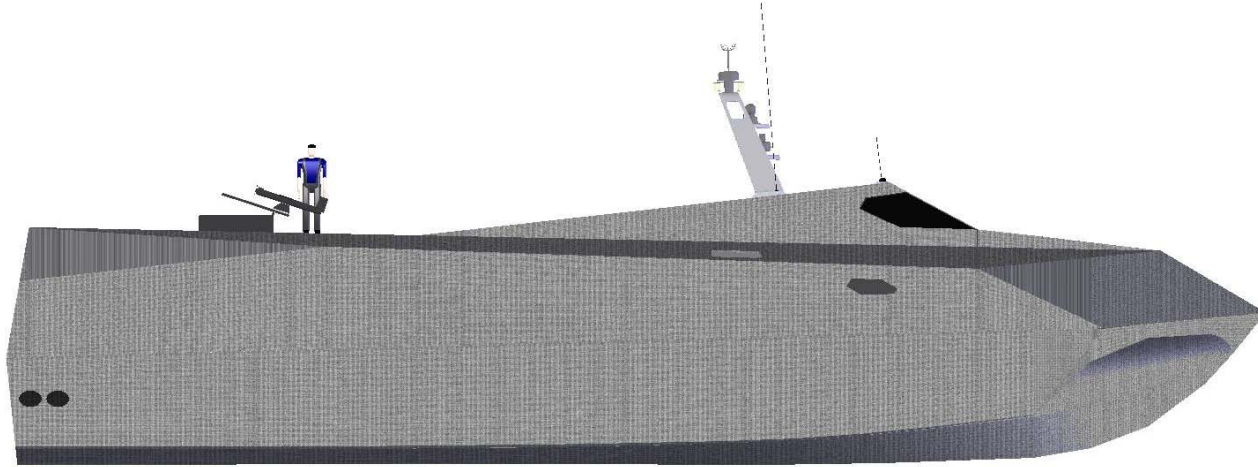


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...UAV Launch & Retrieval



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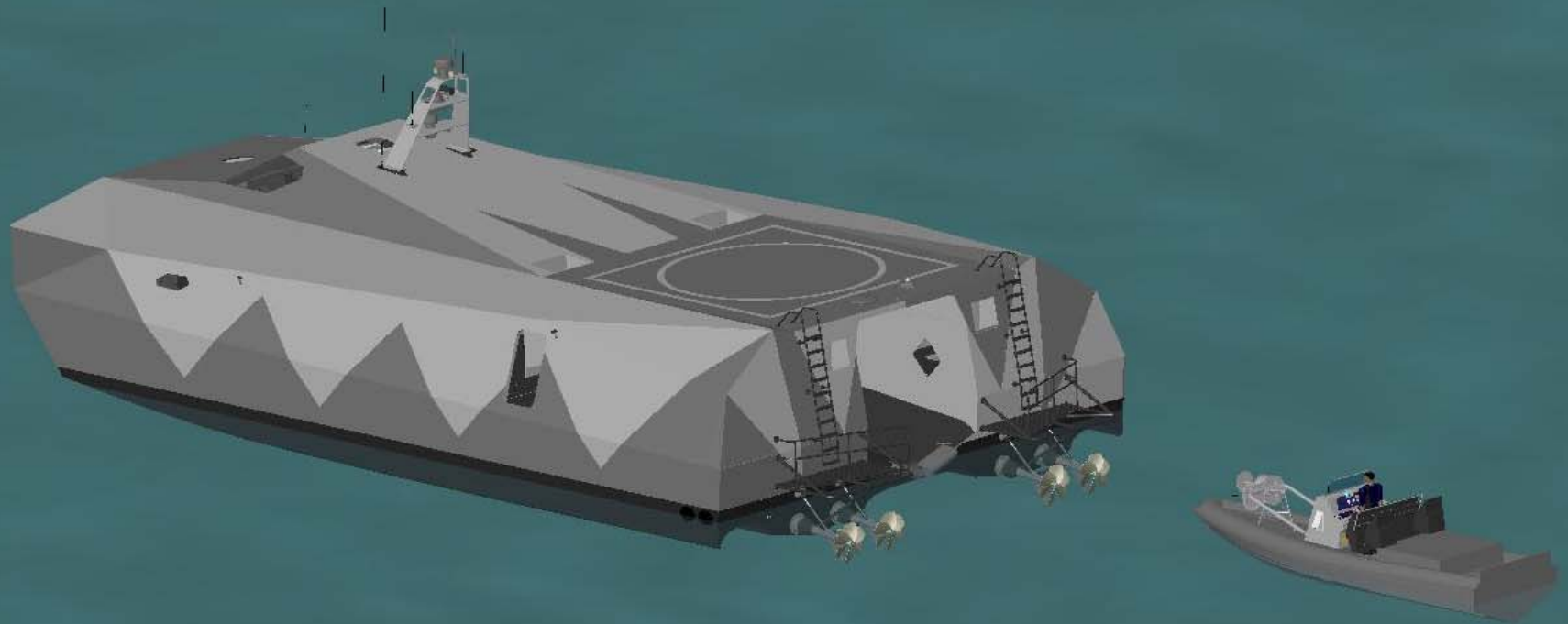




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...11M RHIB Launch & Retrieval

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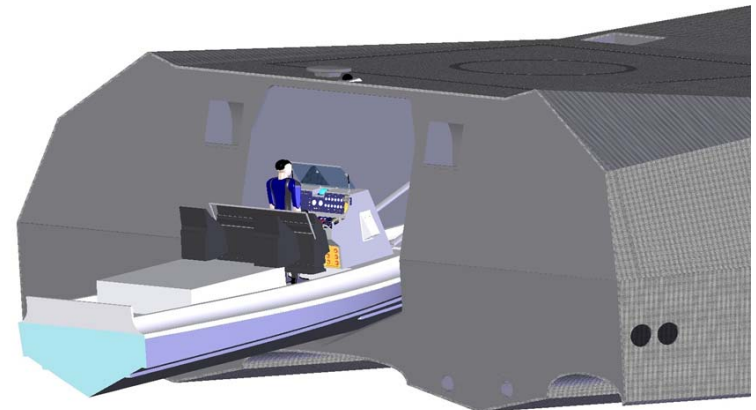
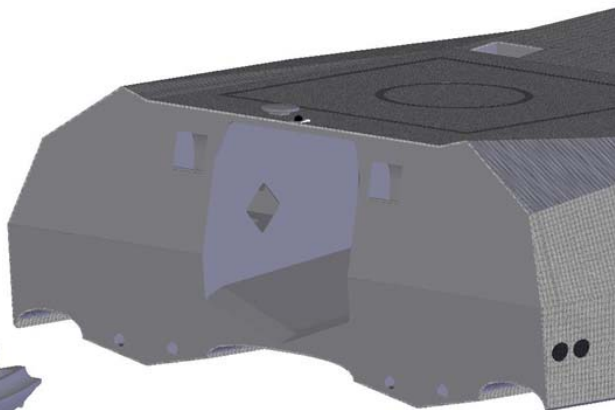
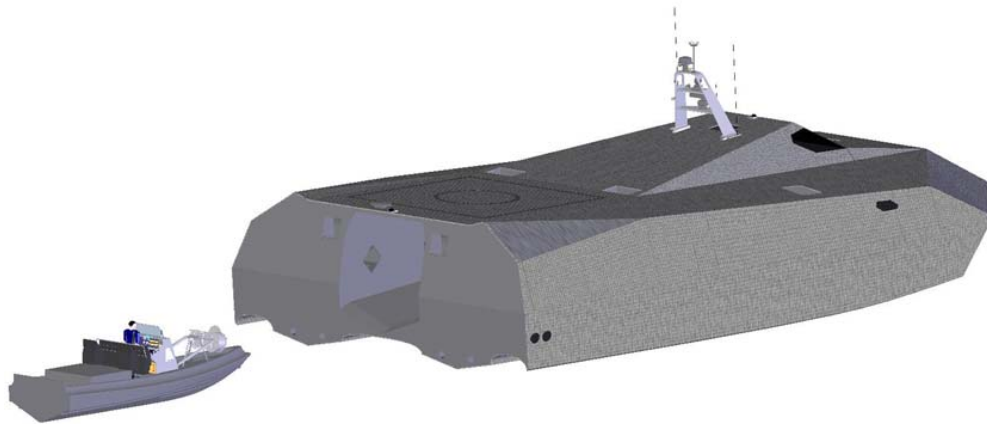


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...11M RHIB Launch & Retrieval



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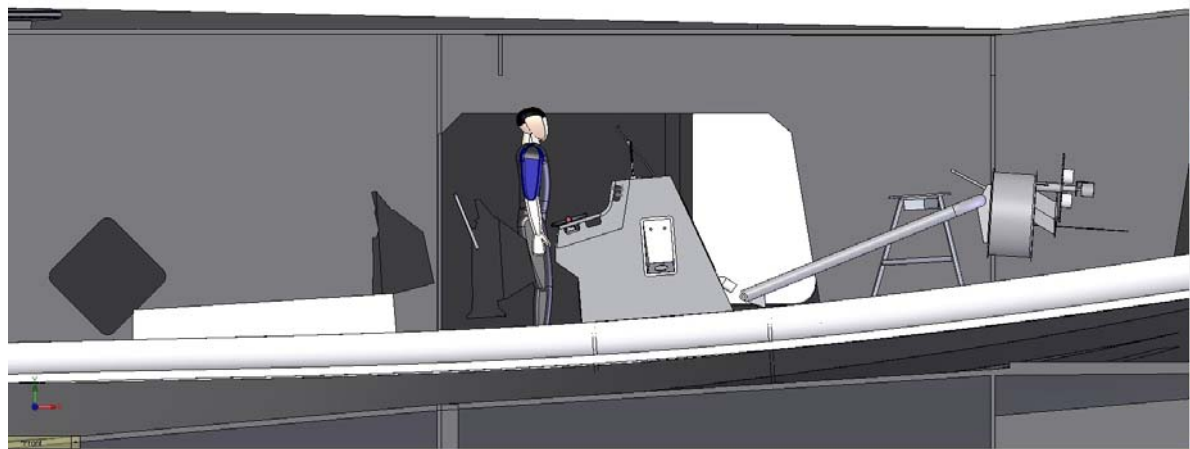
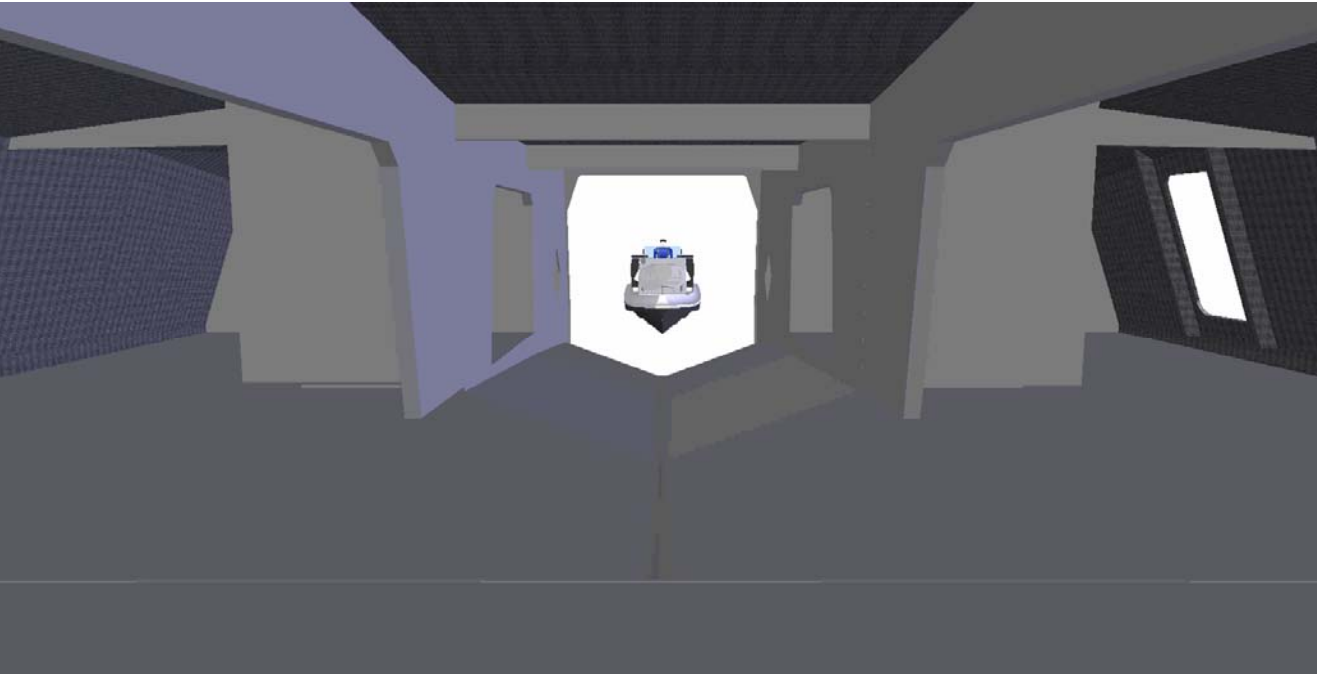


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...11M RHIB Retrieval



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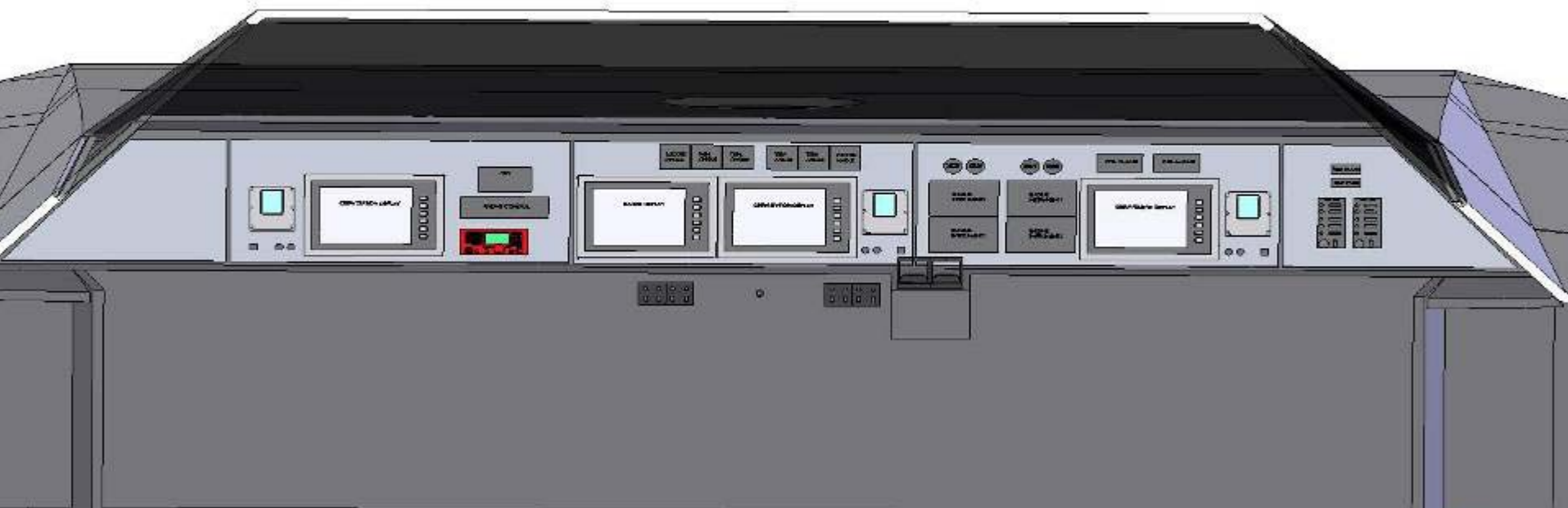
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...Crew Cockpit

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- **TACAIR functionality on the sea surface** - *Fully Networked Interfaces*
 - **Discriminate & Decide** *with locally controlled tactical components*
 - **Command & Control** *distributed autonomous systems*
 - **Task & Direct** *operational assets and sensors*





Electronic Keel

...Maritime Data Bus



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Genuine modularity: *Flexible architecture to accommodate change...*
Common standards, interfaces and protocols to decrease cost...

- **Craft Systems monitoring**
 - Fuel Tank levels
 - Power generation (Voltage and Current)
 - Bilge Pumps & Flooding Alarms
 - Fire Suppression systems
 - Engine Alarms
- **Navigation & Digital Charting**
 - Electronic charts
 - Radar Overlay
- **Sensor Systems**
 - GPS, depth sounder, heading
- **Intercom/Communications**
 - Voice & data
 - HF/VHF/UHF/SATCOM/ITT Mesh/SIPNET
 - SeaBased networked HUB/Node/Link
- **Video Acquisition**
 - Capture, stow and frame grab
 - FLIR (IR and Low Light)
 - Low Light Cameras
- **Situational Awareness**
 - Open Source Software (DOD controlled)
- **Processing Power**
 - Cluster Supercomputing
 - Memory (plenty)
- **Command & Control**
 - Manned & Unmanned Assets
 - Off Board Sensors – Hyper/SSS/Video
 - Mission Planning (HVAC / Networked)
 - Sockets (plug and play carry-on)
 - Common Operating Displays



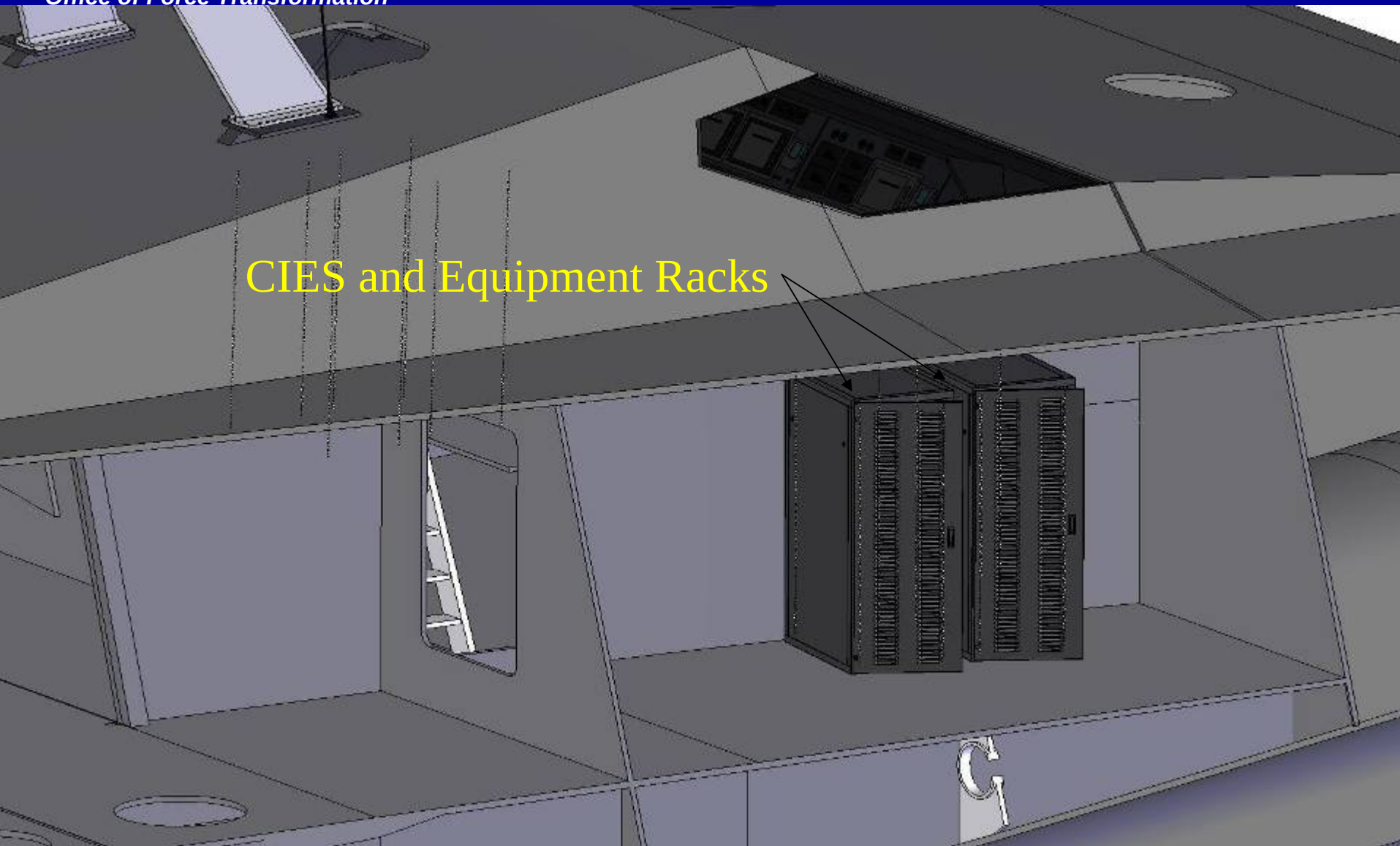
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... Electronic Keel - 1 GB LAN



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CIES and Equipment Racks





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...Testing - Envelope Management



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- **Technical Utility:** *Craft evaluation will include the following...*
 - ✓ **Calm Water Naval Architecture Trials**
 - ✓ **Rough Water Naval Architecture Trials**
 - ✓ **Maintenance, Reliability, Sustainability Studies**
 - ✓ **Accessibility, Design Space, Ergonomics Studies**
 - ✓ **Development of Computational Models**
 - ✓ **Comparisons with Model Testing**
 - ✓ **Scalability of Design**



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...Operational Experimentation



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- **Operational Utility:** *Craft Operational Experimentation will include...*
 - ✓ with NSWG TWO, NSWG FOUR, DEVGRU, NSCT-1
 - ✓ with USCG (DHS) (Maritime Interdiction Operations)
 - ✓ 11m RHIB & CRRC Operations (Launch & Retrieve)
 - ✓ Unmanned Vehicles Operations (UAV / USSV / UUV)
 - ✓ Disaster Relief / Austere Environment support
 - Communications HUB / Network Node
 - ✓ Surrogate test platform for...
 - *emerging technology,*
 - *networked assets and*
 - *operational concept development*



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...Schedule of Events



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Current schedule:

- **Operational Outfitting:** *January 2006*
- **Craft Acceptance:** *April 2006*
- **Naval Architecture Trials:** *March – April 2006*
- **First Operational Experiment:** *May 2006*
- **Craft Transfer to East Coast:** *Summer 2006*
- **Computational Modeling:** *Aug 06 – December 07*
- **Equipment Experimentation:** *May 06 – December 08*
- **NSW Experimentation:** *Aug 06 – TBD*



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...USSOCOM R&D Partnership



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Included in exploration

- M Hull availability
- Mission Reconfigurable
- Open Payload Space
- Open Deck Space
- Flexible Electronic Keel
- Networked Comms
- Super Computer
- SIPRNET Connectivity
- 11 M RHIB
- Experimentation Funding

Future Equipment Options

- Additional Comm Gear
- Mission Specific Equipment
- Weapons
- Dedicated UAV / USV
- Additional Sensors



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...Technical Support

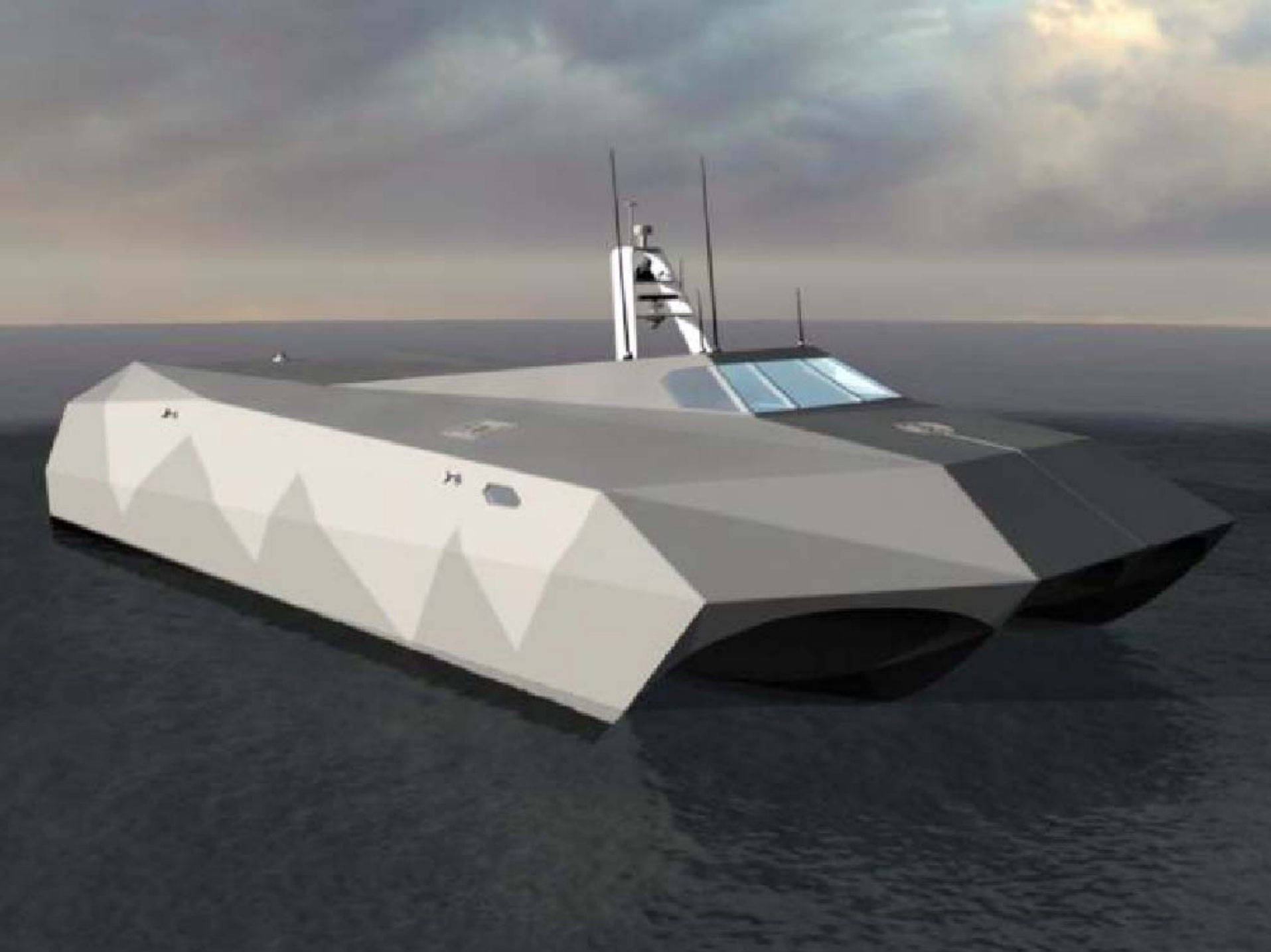


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NSWCCD providing the following support:

- **Contracting Agent / Documentation**
- **Design review**
- **Construction review / oversight**
- **Risk assessment for Sponsor**
- **Test plan development**
- **Experimentation planning**
- **Operational equipment installation**











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