



# APACTS

Automated  
Paint  
Application,  
Containment, and  
Treatment System



CARDEROCK DIVISION  
NAVAL SURFACE WARFARE CENTER



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- Drydock Operations have critical environmental compliance issues
  - VOCs & HAPS by NESHAP (Air)
  - Metals – Particularly Copper for NPDES (Water)
- The Antifouling Coatings are a major source
- No equivalent “green” coatings on the horizon
- Cost for traditional technologies is prohibitive
- **Objective:** design and demonstrate a paint application system that can reduce the present and future costs of environmental compliance

- **Increase Paint Transfer Efficiency (PTE)**
  - Baseline: 65%
  - Goal: 85%
  - Demonstrated: 95%
- **Painting Application Rate**
  - Baseline: Manual rate ~ 20,000 square feet per shift
  - Goal: 20,000 square feet per shift
  - Demonstrated: > 2,500 square feet per hour
- **Overspray Capture**
  - Baseline: No overspray is currently captured
  - Goal: 95%
  - Demonstrated: 80 to 95%

## ➤ Paint usage

- Goal: 35% reduction

## ➤ Cost

- Goal: 1 million dollars per unit

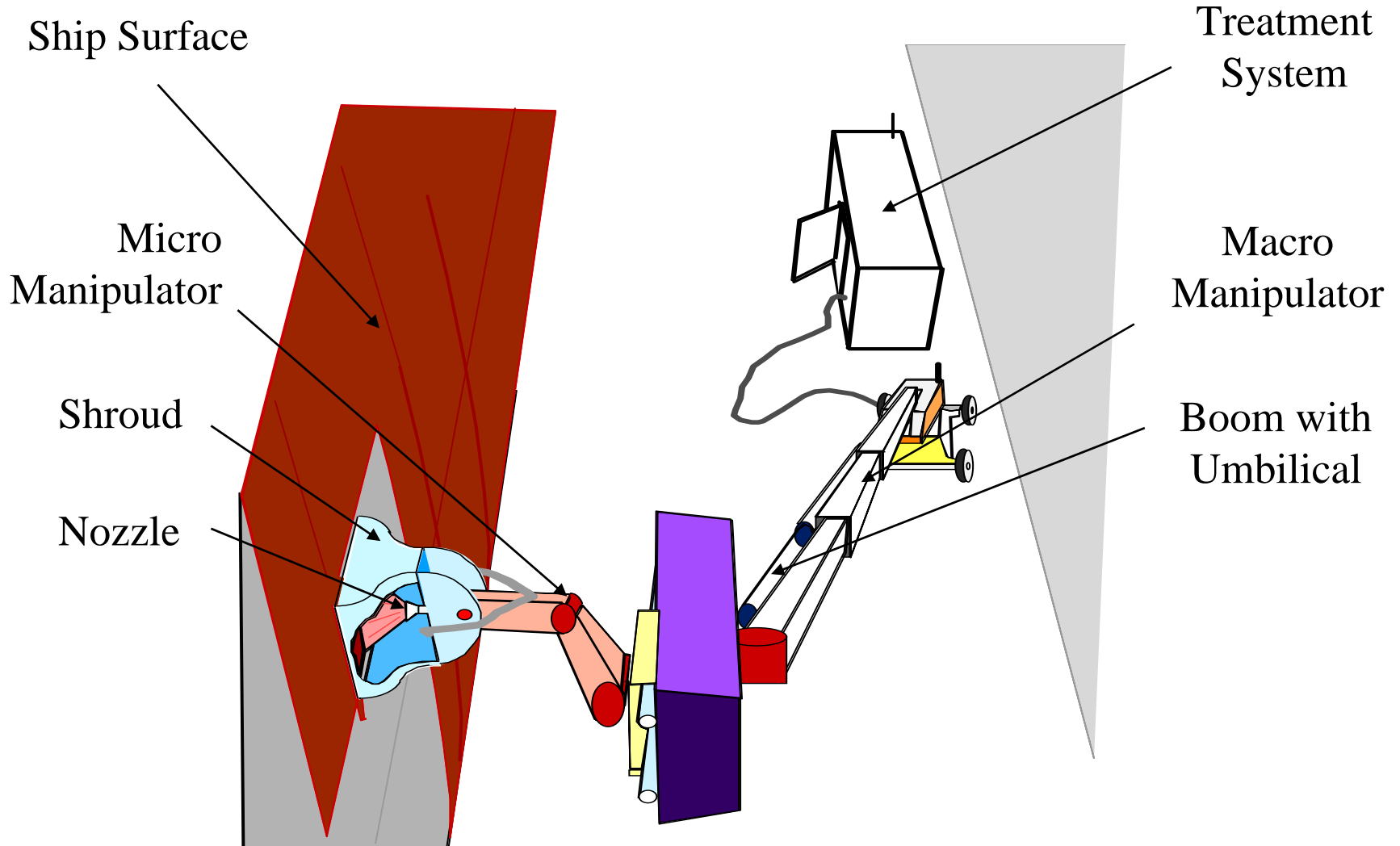
## ➤ Life Cycle Enhancements

- Baseline: 3-4 years
- Goal: 10 – 12 years

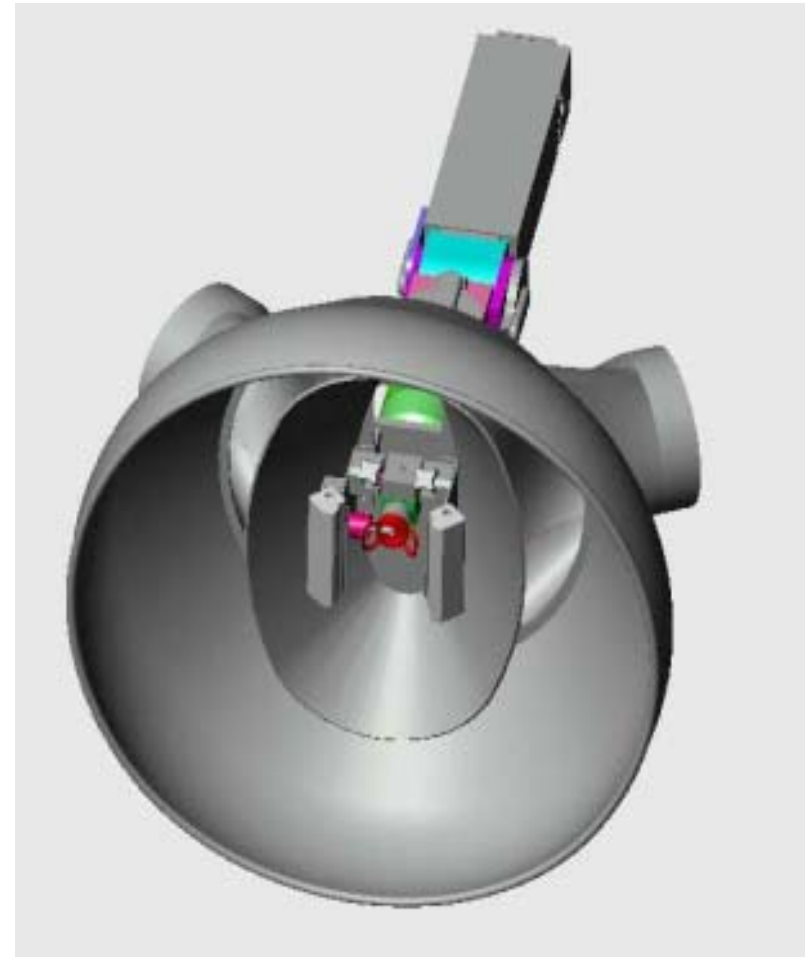
## ➤ VOC Capture and Treatment

- Baseline: No capture or treatment
- Goal: 50% capture & 95% removal/treatment

# APACTS Concept



# APACTS 2nd Generation Shroud



# *Demonstrated Paint Application and Overspray Capture System*





Vessel Type	# per year	Cost (Thousands of dollars)			
		Present Cost	w/ 2 APACTS	Life-cycle Savings	Avoidance
CVN 68 Aircraft Carrier	2	1,150	530	354	974
SSN688 Submarine	2	222	126	84	180
DD963 Destroyer	6	1,026	618	412	820
<b>Total</b>	<b>10</b>	<b>2,398</b>	<b>1,274</b>	<b>850</b>	<b>1,974</b>

Assumes only 2 APACTS units are implemented

Data based upon ARL TM00-00-9: Cost Benefit Analysis for APACTS

## ➤ Demonstration Target

- Site: Puget Sound Naval Shipyard (PSNY)
- Date: FY 02
- Vehicle: Trident Submarine
- Contact: Ms. Mary Tallman, Code 971  
Puget Sound Naval Shipyard  
1400 Farragut Avenue  
Bremerton, WA 98314  
Ph: (360) 476-3158 e-mail: [tallman@psns.navy.mil](mailto:tallman@psns.navy.mil)

## ➤ Transition

- 2002 to 2003: Prototype hardening and commercial shipyard marketing
- 2003: Formal transition to PSNY
- 2005: Complete implementation of 2 APACT units at PSNY

## ➤ Tangible:

- Life Cycle Cost Avoidance
  - ✓ Extend hull-coating life-cycle by improving painting operations which will support selective striping
  - ✓ Will meet 10-12 year docking schedule

## ➤ Intangible

- Minimize shipyard compliance costs
  - ✓ Increase and maintain compliance with the Clean Air Act (CAA)
  - ✓ Assist in meeting pending regulations for NPDES and stormwater associated with the Clean Water Act (CWA)
  - ✓ Minimize the disposal costs associated with paint and paint stripping wastes to help comply with RCRA
- Sustain Navy shipyard operations in environmentally sensitive areas
  - ✓ Puget Sound, Chesapeake Bay, Pearl Harbor, California, Etc