



# KiteShip Corporation

Wind Power for Ships



TRANSPORTATION PRIZE  
 CALIFORNIA  
CLEAN TECH OPEN  
2006 WINNER

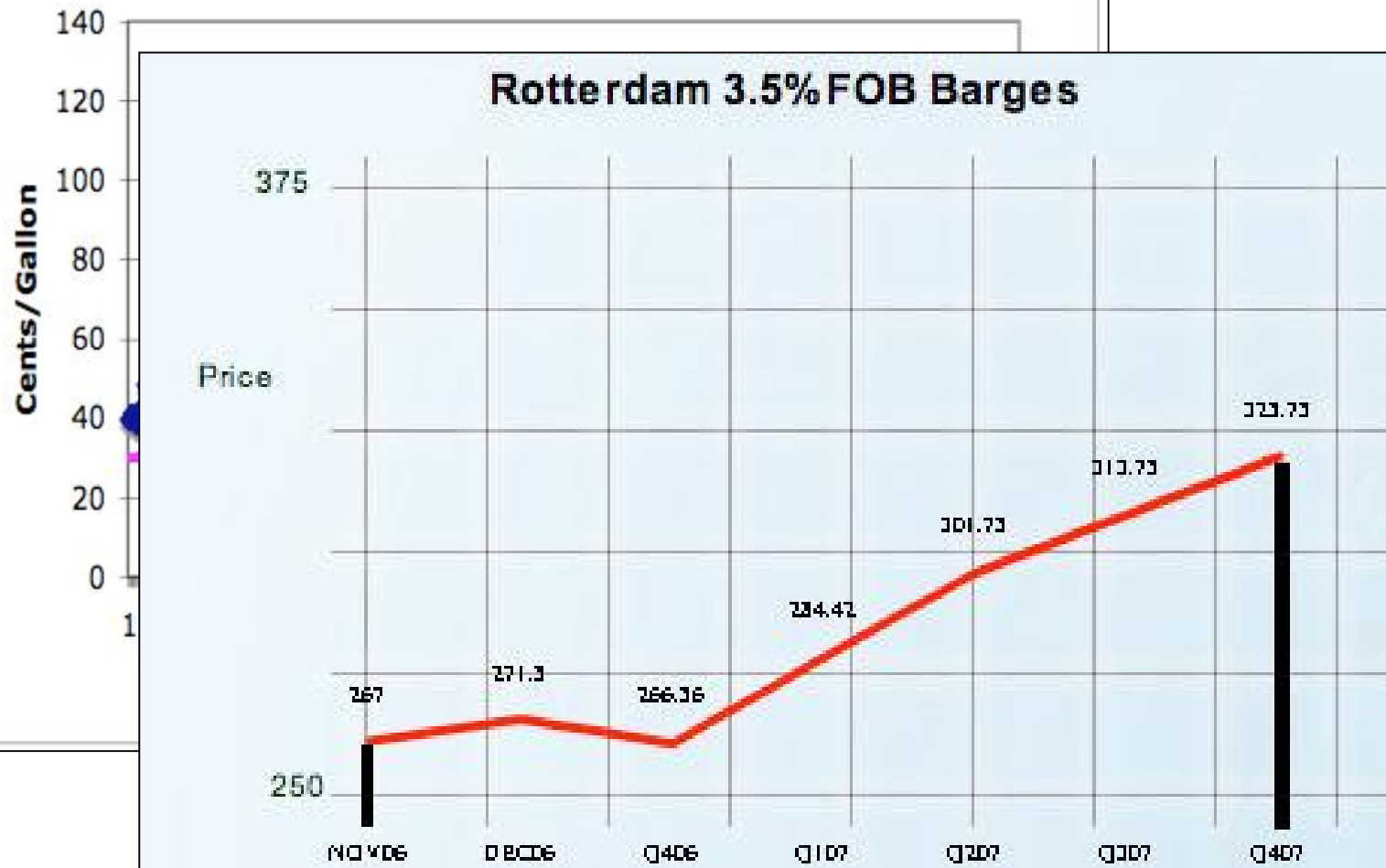
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# The Problem

- Shipping is a historically conservative, stable industry; being abused from all sides
- Fuel costs for a single large ship run \$12–33M/year
- Polluting emissions 900 times greater than road gas or diesel
- Increasing environmental legislation crippling razor-thin profit margins

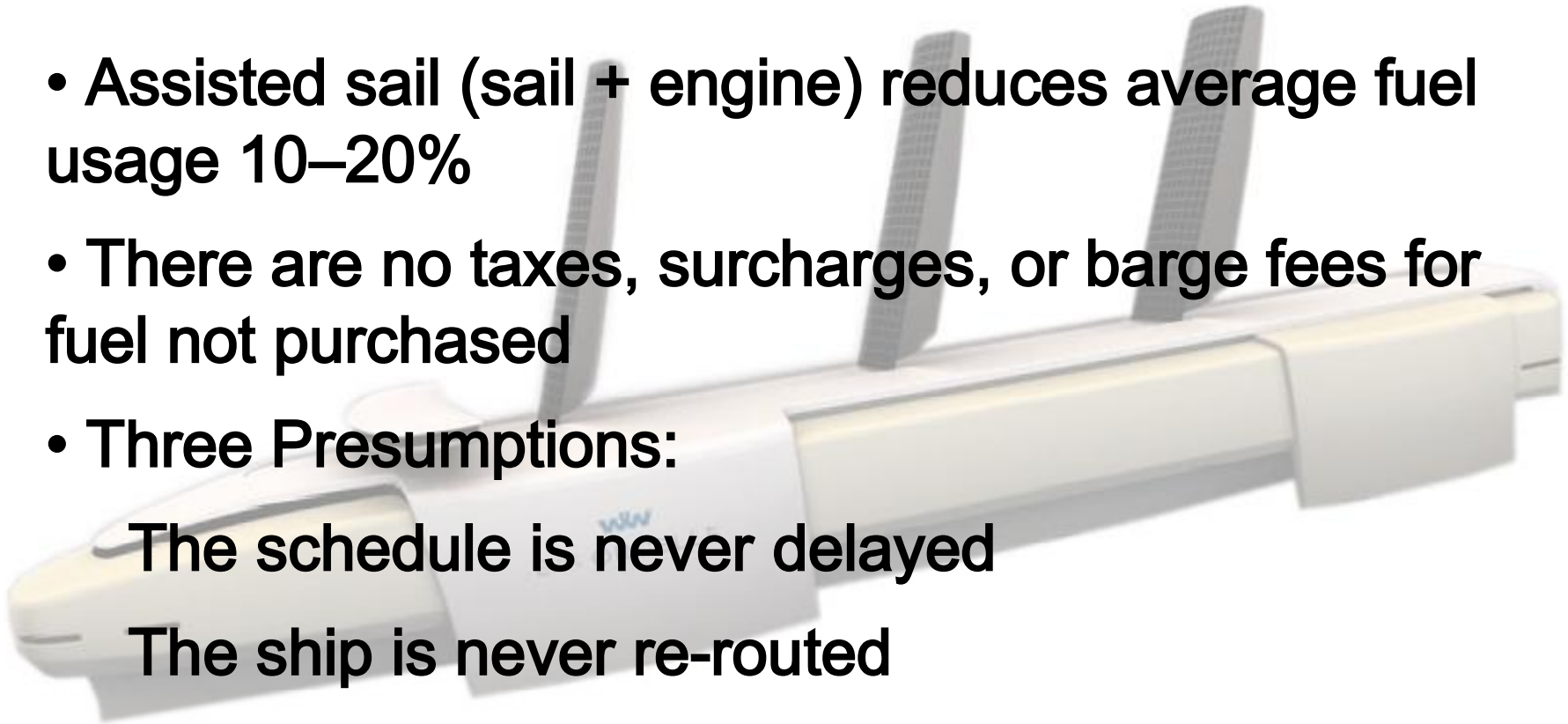
Photo by Steve Ringman, [The Seattle Times](#)

### US Gulf Coast Residual Fuel Prices 8/96 - 8/06



# Sail Assist, not Sail Power

- Assisted sail (sail + engine) reduces average fuel usage 10–20%
- There are no taxes, surcharges, or barge fees for fuel not purchased
- Three Presumptions:
  - The schedule is never delayed
  - The ship is never re-routed
  - The ship is never “maneuvered” for sailing



# Sail Assist Pros

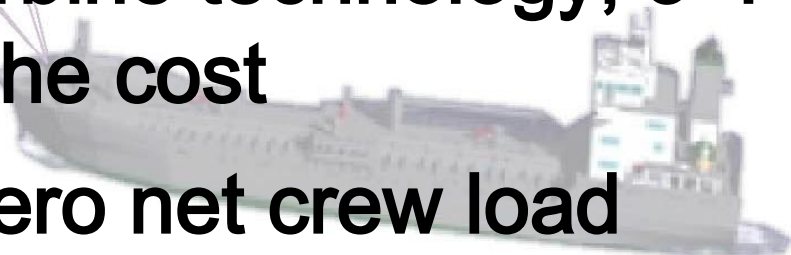
- Significant fuel savings
- Improvements in maintenance, parts, labor
- Potential Govt subsidy; “Green” credits

# Sail Assist Cons:

- No retrofit
- Adds 1000+ tons, including addl reinforcing throughout
- Severe bridge, loading equipment problems
- Costs \$12-20 million; barely feasible

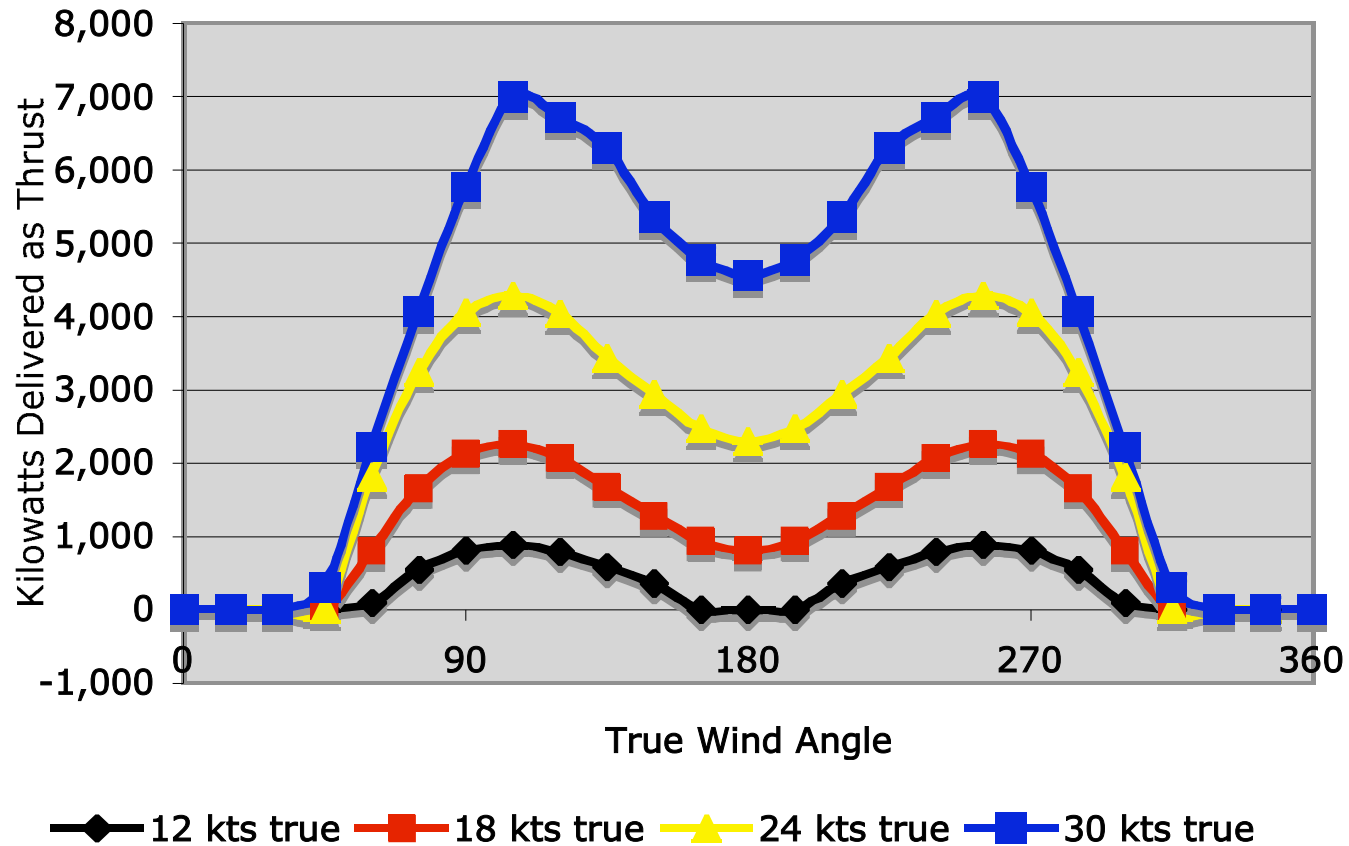
# Why Kite Technology?

- Comparable kite system costs \$2–2.5M, simple to retrofit.
- ROI 2.5–4 years; much less if distillate fuels are adopted
- ROI not overly sensitive to oil prices
- Compared to wind turbine technology, 3-4 times as efficient; 1/5 the cost
- Can be built to add zero net crew load



# Kite Power as Thrust

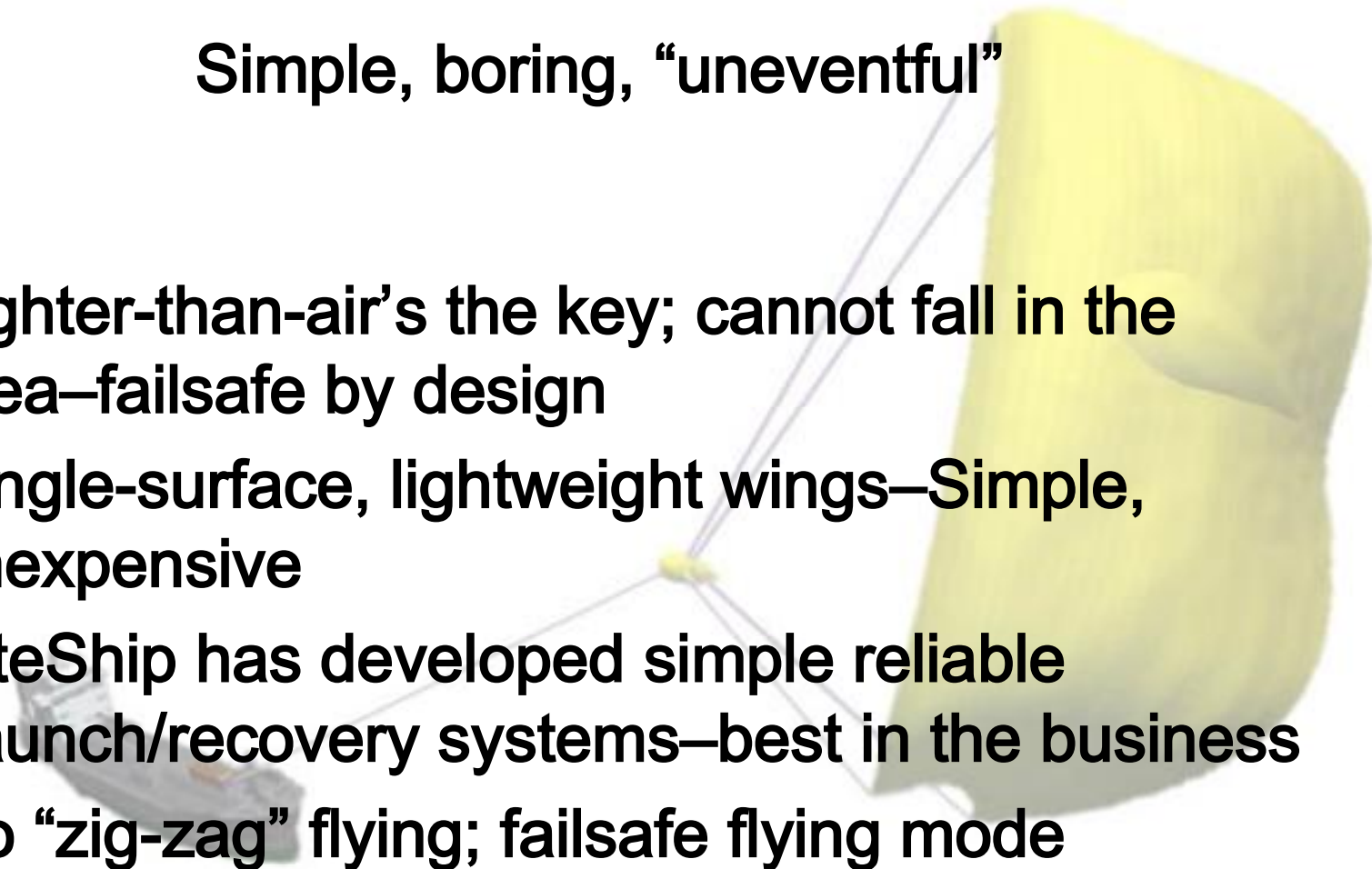
**50,000 sf Kite; 95,000 GWT Tanker @ 14 kts**



# How Do We Do It?

Simple, boring, “uneventful”

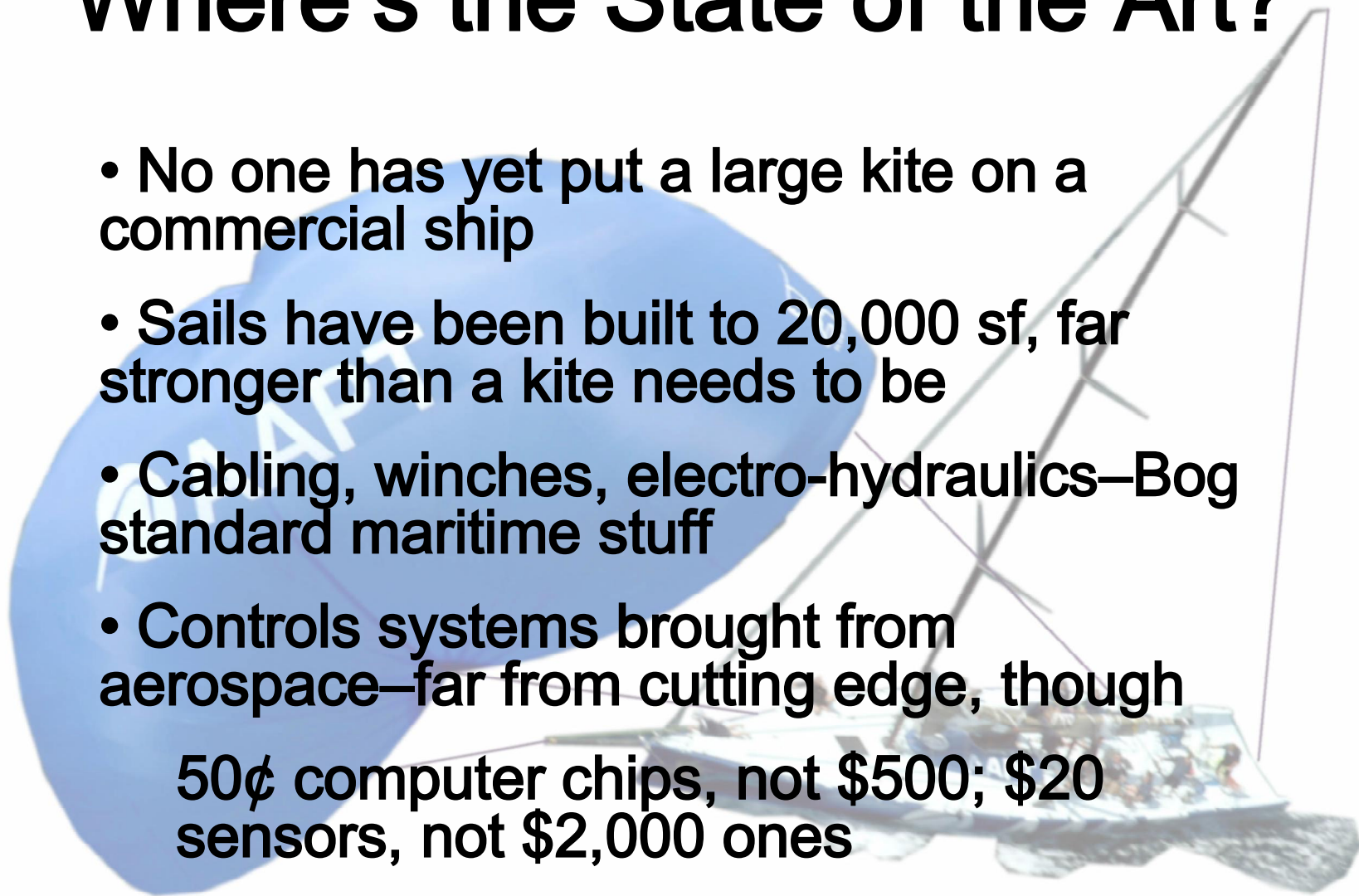
- Lighter-than-air’s the key; cannot fall in the sea—failsafe by design
- Single-surface, lightweight wings—Simple, inexpensive
- KiteShip has developed simple reliable launch/recovery systems—best in the business
- No “zig-zag” flying; failsafe flying mode





# Where's the State of the Art?

- No one has yet put a large kite on a commercial ship
- Sails have been built to 20,000 sf, far stronger than a kite needs to be
- Cabling, winches, electro-hydraulics—Bog standard maritime stuff
- Controls systems brought from aerospace—far from cutting edge, though
  - 50¢ computer chips, not \$500; \$20 sensors, not \$2,000 ones



# How Much?

- A 15,000–20,000 sf complete kite system will be under \$800k in production; will save \$300k/year on a 30,000 ton vessel

- A 35,000 sf system will be under \$1.8 million; will save 600k/year on a 50,000 ton vessel

- A 50,000 sf system will be under \$2.5 million; will save \$700-900k/year on an Aframax tanker

- Distillate fuels will double above savings; halve ROI (Savings based on level, \$280/ton HFO)

Beginning Cash Balance	12,000	(340,080)	3,650,549	326,699	2,980,349
Cash Inflows (Income):					
OutLeader Revenues	220,000	325	600,000	225,000	0
OutLeader license fees		75,000	160,000	350,000	520,000
VLFFS Revenues		5,000,000	5,680,000	20,000,000	61,000,000
Military R&D contracts	326,000	790,000	750,000		
IP licensing			250,000	750,000	1,500,000
Funding proceeds		7,500,000			
Total Cash Inflows	576,000	8,385,325	6,340,000	21,325,000	63,020,000
Available Cash Balance	588,000	8,045,245	11,090,549	21,651,699	66,000,349
Cash Outflows (Expenses):					
Advertising	18,000	34,000	100,000	155,000	210,000
Marketing	18,000	34,000	125,000	175,000	250,000
Sales Commissions	7,000	13,000	40,000	60,000	85,000
Insurance	6,000	26,000	32,000	40,000	55,000
O.L. Incentives			20,000		20,000
VLFFS R&D Expenses		1,000,000	1,000,000	1,000,000	932,000
VLFFS Inventory	75,000	1,266,000	3,982,000	8,352,400	16,850,000
Maintenance Repairs	18,700	38,400	27,500	33,500	59,500
Operating Supplies	6,000	16,000	27,000	34,000	65,000
Payroll	21,600	536,400	982,800	1,312,200	1,625,400
Payroll Expenses	21,600	536,400	982,800	1,312,200	1,625,400
Contract Labor	16,000	125,000	490,000	720,000	900,000
Professional Fees	12,000	30,000	60,000	90,000	120,000
Patent Filing and Fees	12,000	75,000	150,000	150,000	150,000
Communications Equip	4,500	75,000	95,000	110,000	149,000

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