FUEL SAVING STRATEGIES FOR TUG AND BARGE OPERATORS

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GREENTECH 2015 CONFERENCE
EIGHT MOST PROMISING FUEL SAVING MEASURES

Technical Solutions
• Fuel consumption monitoring
• Hydralift skegs
• High-efficiency nozzles
• Hull optimization

Operational Solutions
• Barge trim
• Voyage planning tools
• Pushing configuration
• Propeller polishing

Photo courtesy of Ken FitzGerald
PROJECT BACKGROUND

Focus of Research:
- Reducing fuel consumption
- River and open-water barge operations
- Technologies and strategies that offer best return on investment
- New construction or retrofit
- Physical mods, operational changes, or both

Certain technologies and strategies identified here could result in fuel savings of ~20%.

Combining two or more could result in very significant reductions >20%.
TECHNICAL SOLUTIONS
FUEL CONSUMPTION MONITORING

- Flow meters
- Collect data
- Onboard & office
- Influences behaviors

Up to 10% Fuel Savings indirectly realized
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- Directional stability
- Traditional boxy skeg
- Lift and drag
- Added thrust
- Reduces towing resistance
- 1 knot speed increase

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- Ducted propeller
- Increases thrust
- Kort nozzle
- High efficiency nozzle
- Bollard pull increase 12% to 50%
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OPERATIONAL SOLUTIONS
OPTIMAL BARGE TRIM

• Minimizes resistance for a given operating speed and draft.

• Industry perception that aft trim improves directional stability.

• This introduces additional resistance.

Potential fuel savings >2.5%.
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VOYAGE PLANNING

• State of the art tools that provide vessel operators with useful information.
  – Active weather routing
  – Voyage optimization services and software
  – Proprietary modeling tools / software
  – Systematic processes for data collection and post-voyage analysis

Savings vary. May exceed 4%.
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PUSHING VS. TOWING ASTERN

- There are inherent disadvantages in towing barges astern.

- Pushing ahead:
  - Eliminates barge yaw
  - Reduces resistance from towing gear
  - Reduces resistance from wind and waves

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- Decreases propeller roughness.
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SUMMARY

Eight fuel saving measures
How do we incentivize fuel savings?
Experiment with operations, collect data
Test known assumptions