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Wash Efficiencies That Will Save You Money

Charlie Borchard, PurClean
Rich Hays, DRB Systems
Sharon James, Rockwell Automation
Moderated by: Anthony Analetto, Sonny's


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Primary Ways to Reduce Costs

- Water Reclaim
- Power Conservation
- Labor

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Energy Savings in the Car Wash Industry through Variable Frequency Drives

Sharon James
Application Engineer
Rockwell Automation Inc.

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Agenda

- Explain the terms - Energy Savings and VFD's
- VFD 101
- How do VFD's save energy?
- Energy savings Calculations

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'Energy Savings', 'Variable Frequency Drives' - terms explained

- What is Energy Savings?
- What are Variable Frequency Drives?

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VFD 101

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How do VFD's save energy?

- Blowers ,Dryers, Pumps are Variable Torque loads
- Majority of Blowers ,Dryers, Pumps are Centrifugal Devices
- Affinity Laws Apply to All Centrifugal Devices

Contd..

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Q. How do VFD's save energy in variable torque loads/centrifugal loads? A. Because of Affinity Laws

<p>Flow Changes Linearly with Speed</p> $\frac{Q_2}{Q_1} = \frac{N_2}{N_1}$	<p>Pressure is Proportional to the Square of Speed or Flow</p> $\frac{P_2}{P_1} = \left(\frac{N_2}{N_1}\right)^2$	<p>Power is Proportional to the Cube of Speed or Flow</p> $\frac{HP_2}{HP_1} = \left(\frac{N_2}{N_1}\right)^3$
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Q= Flow ; P= Pressure ; HP=Power; N= Speed of Motor

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Energy Savings Calculations- An Example

A 25 HP fan needs to supply air 10 hours a day for 300 days a year.

The cost of running a fan at full speed, across the line for the entire year would be:

$$25 \text{ HP} \times 0.746 \text{ kW/HP} \times 3000 \text{ hrs} \times 0.12 \text{ kW/hr} = \$ 6714.00$$

Assuming that the fan does not have to run at full speed all the time;

25% of the time at 100% speed;50% of time at 80% speed;25% of time at 60% speed

The cost of running the fan with a variable frequency drive would be:

$$25 \text{ HP} \times 0.746 \text{ kW/hp} \times 750 \text{ hrs} \times 0.12/\text{kWhr} \times (1.00)^3 = \$ 1678.50$$

$$25 \text{ HP} \times 0.746 \text{ kW/hp} \times 1500 \text{ hrs} \times 0.12/\text{kWhr} \times (0.80)^3 = \$ 1718.78$$

$$25 \text{ HP} \times 0.746 \text{ kW/hp} \times 750 \text{ hrs} \times 0.12/\text{kWhr} \times (0.60)^3 = \$ 362.56$$

Total = \$ 3759.84

Potential Annual savings would be \$ 6714.00 – \$ 3759.84 = \$ 2954.16

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Additional VFD Benefits

- Reduced Voltage Starting
- Improved Process Control
- Noise Control
- Reduced Mechanical Wear and Tear
- Improved System maintenance
- Multi Motor Control
- Energy Rebates
- Support **Green Building** Movement
 - LEED Green Building rating ; prerequisite is to meet the mandatory and performance requirements of the ASHRAE 90.1 2004
 - Individual variable air flow fans with motors greater than or equal to 15 Hp use variable frequency drives.



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Labor Productivity

Rich Hays
DRB Systems

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Labor is The Largest Controllable Expense



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Major retailers provide good examples of why cutting wages is not the best way to control labor costs



Save money. Live better.™




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	<u>Costco</u>	<u>Sam's Club</u>
• Hourly Wage	\$16.00	\$11.52
• Labor Cost	9.8% of volume	17% of volume
• Operating Profits per Hourly Employee	\$13.6k	\$11k
• Sales Per Sq. Ft	\$795	\$516

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Productivity, Not Pay, Is the Key to Controlling Labor Costs

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Computerized cash registers help control costs

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Allows employees to be more effective at selling upgrades and extra services



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Increased Throughput
+ More Dollars Per Vehicle
= *Greater Labor Productivity*

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Increased Productivity Created By:

- The Self-Pay Terminal
- Wireless Acceptance Systems
- Automatically Recharged Monthly Passes
- Instant Credit Card Clearing
- Prepaid Cards
- Hand-Held Terminals

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The self-pay terminal has played a key role in increasing productivity at car washes

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Self-pay Does Not Mean Self-Service

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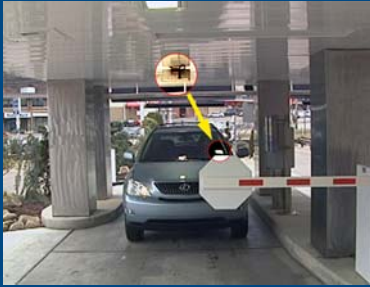
Installing Pay Stations

- Allows greeters to focus on higher return tasks
 - Talking to customers
 - Explaining various packages
- Example:
 - Busy Bee Car Wash
 - 8.2% increase of dollars per vehicle

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Self Pay +

Wireless Acceptance +

Automatic Pass Recharging =

Hands Free Carwash Transactions

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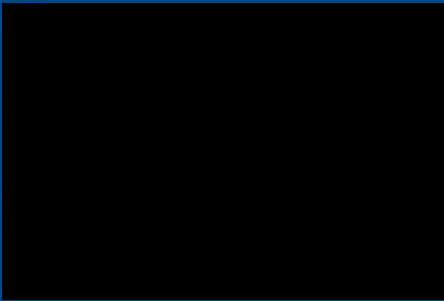
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*Washing More Cars Per Employee
Means More Money To Invest In
Training & Service Enhancements*

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Other Technologies

- Instant Credit Card Clearing
 - Clears Credit Cards in less than 2 seconds



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Other Technologies

- Prepaid Cards
 - Eliminate the slowdown of cash transactions



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Other Technologies

- Portable Computer Terminal
 - Clear Credit Cards
 - Call up customer histories
 - Print wash tickets



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