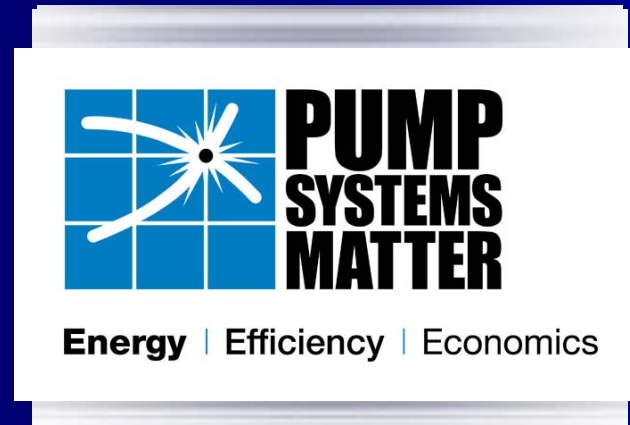


Pump Systems Matter
Energy Summit

Mgr. Performance Services
PumpSmart™ Control Solutions

Mike Pemberton
ITT IBG Goulds Pumps



Mike Pemberton

- Has 25 year of sales and marketing management experience in industrial process automation with companies including Honeywell Industrial Controls and Emerson Process Management. Spent the last 6 years with ITT Gould / PumpSmart™ Control Solutions as sales, marketing and now services manager.

Finnish Technical Research Center Report:

"Expert Systems for Diagnosis of the Condition and Performance of Centrifugal Pumps"

- Evaluation of 1690 pumps at 20 process plants:
 - Average pumping efficiency is below 40%
 - Over 10% of pumps run below 10% efficiency
 - Major factors affecting pump efficiency:
 - throttled valves
 - pump over-sizing
 - Seal leakage causes highest downtime and cost

Processes Often Are Not Well Controlled

...process variability exists, in many cases, not because of the raw materials or variations due to natural causes, but because process variability has been introduced into the process through design selection or the adjustment of process and control equipment.”

Source: EnTech Report V11.2
www.emersonprocess.com/entechcontrol/download/

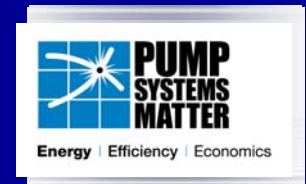
Processes Often Are Not Well Controlled

“Unfortunately, the tendency to oversize control valves has not changed significantly. With each design engineer applying an extra safety margin to avoid the possibility of undersizing

..... most valves end up being too big and operate as low as 15% open on startup...usually makes good process control nearly impossible.”

Source: EnTech Report V11.2

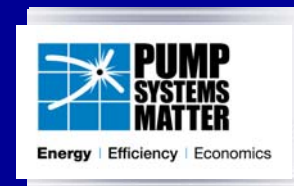
www.emersonprocess.com/entechcontrol/download/



Southeastern Mill Pump System Audit

- Maintenance database revealed that pump MRO cost are 2x greater than control valves or other process equipment.
- The highest cost component failures were bearings, packing and seals.
- An IT Department review of DCS outputs found that 65% of control valves are < 50% open, with many < 30%.

Source: Nov 2002 Pump Audit

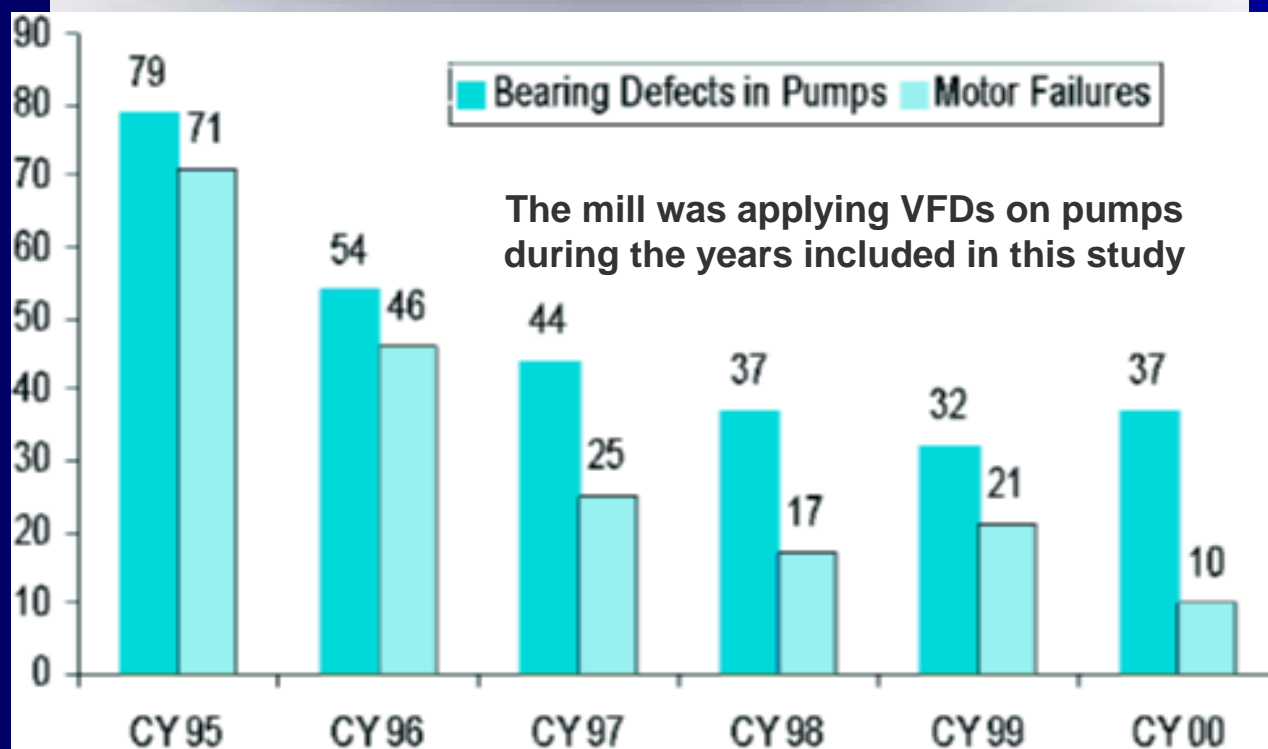


Southeastern Mill Bleach Plant Study

- The #2 oxygen vat dilution pump was the most oversized (6500 GPM vs. 2650 GPM required) with frequent gasket failures, pipe fractures, valve damage, downtime and sewer losses.
- The mill initially installed automated isolation valves and later a VFD. Significant energy and reliability savings are being achieved.
- Initial Project payback of 18 months justified on energy savings alone.
- The original medium voltage motor consumed about 200 Hp, while the new low voltage motor and VFD consumes only 75 Hp.
- Eliminating downtime and repair cost saved \$1M in '05.

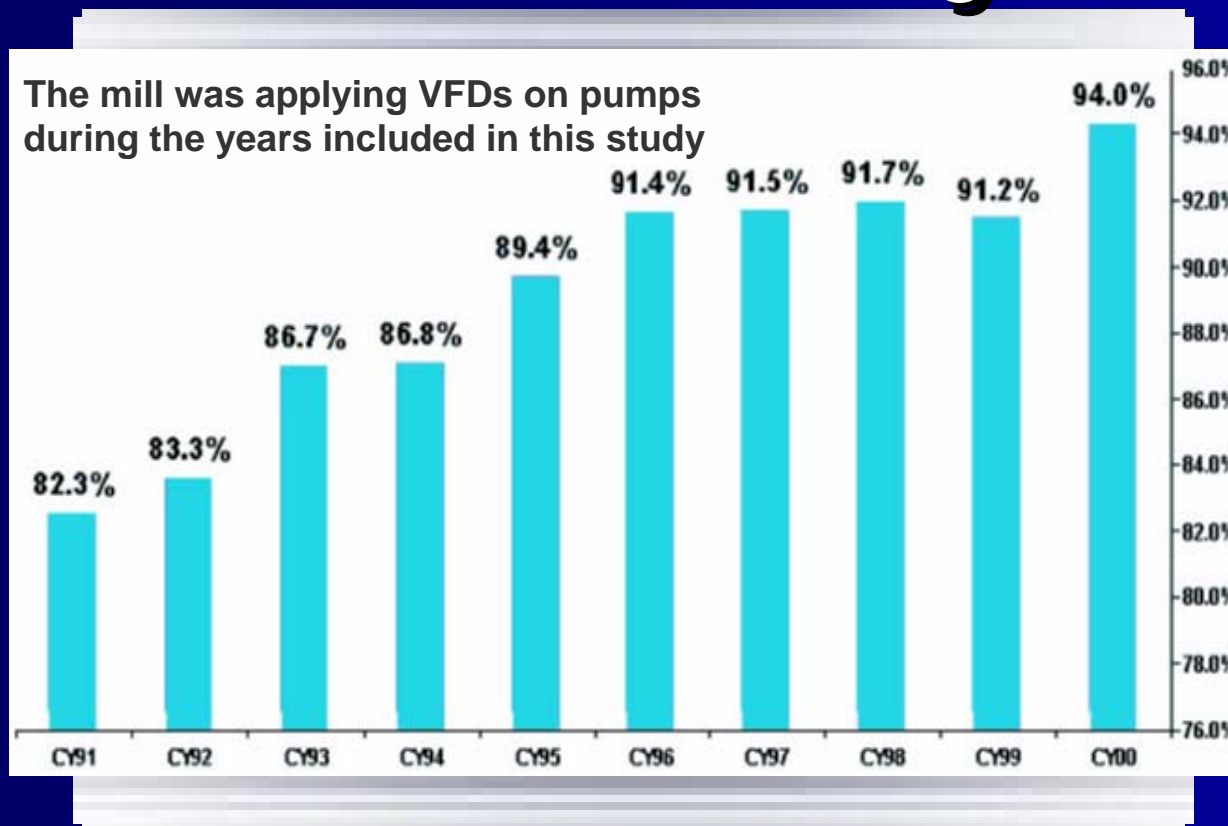
Note: Implemented Automated Gate Valves
2003 / VFD 2004

RCM Reduced Pump Bearing and Motor Failures



TAPPI Solutions! Magazine: "GP Old Town: World Class Reliability"
September 01, 2001 Vol. 01, No. 01

RCM Steadily Increased Plant Availability



TAPPI Solutions! Magazine: GP Old Town: "World Class Reliability"
September 01, 2001 Vol. 01, No. 01

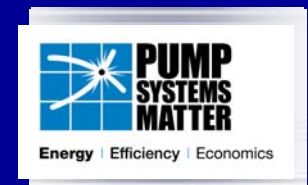


Energy | Efficiency | Economics

U.S. Motor Systems Market Opportunity Assessment

“Motor systems equipped with VSD’s account for only 4% of motor energy usage, compared to the potential for application on 18 and 25% of the total energy used...”

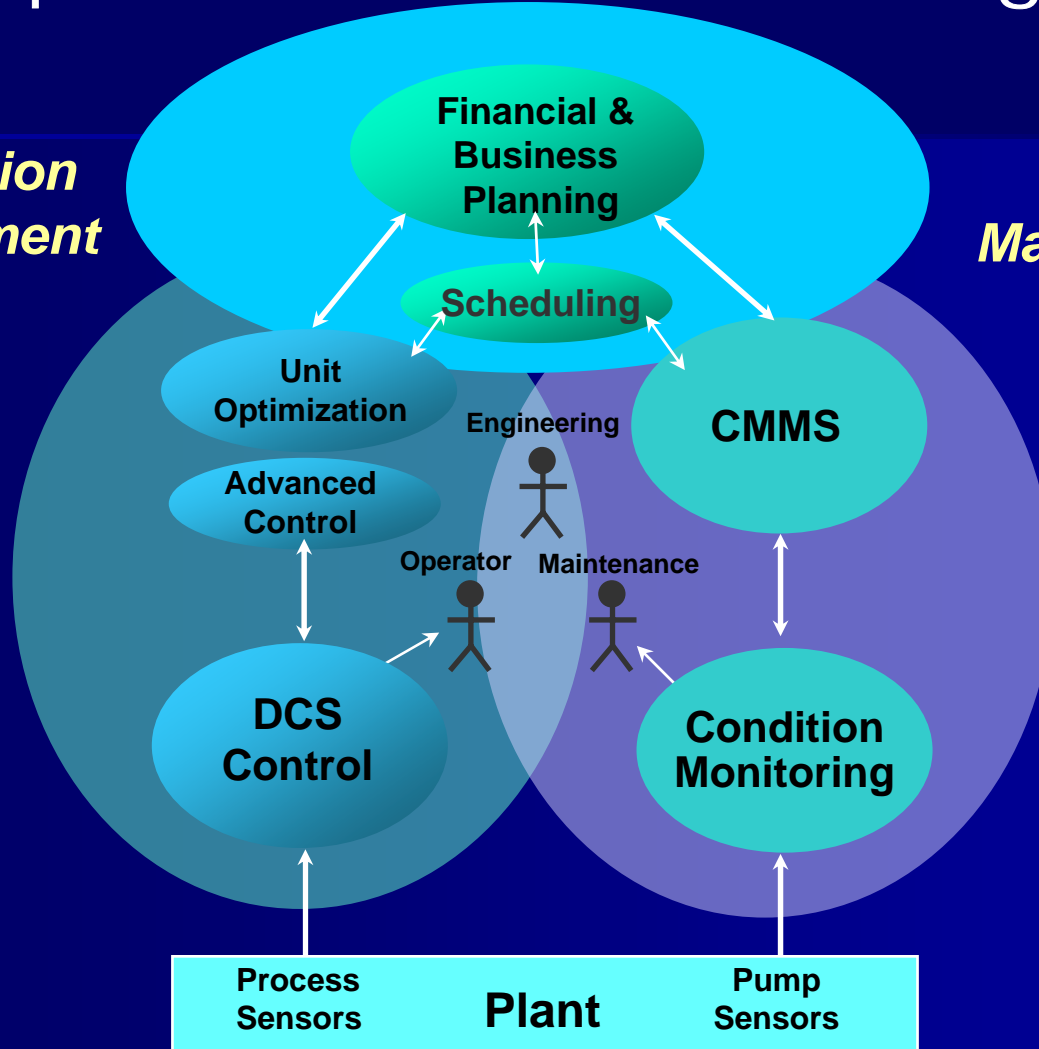
Source: DOE-Office of Industrial Technology, “Motor Challenge”



Enterprise Resource Planning (ERP)

**Production
Management**

**Asset
Management**



Enterprise Asset Management (EAM) "Asset Optimization Benefits Not Realized"

- EAM implementations have left \$*Billions* of Optimization Benefits on the Table.
- Primary Reasons for the Lost Opportunity :
 - Lacks Integrated View of the Performance Data.
 - Condition Monitoring and Production data are missing.

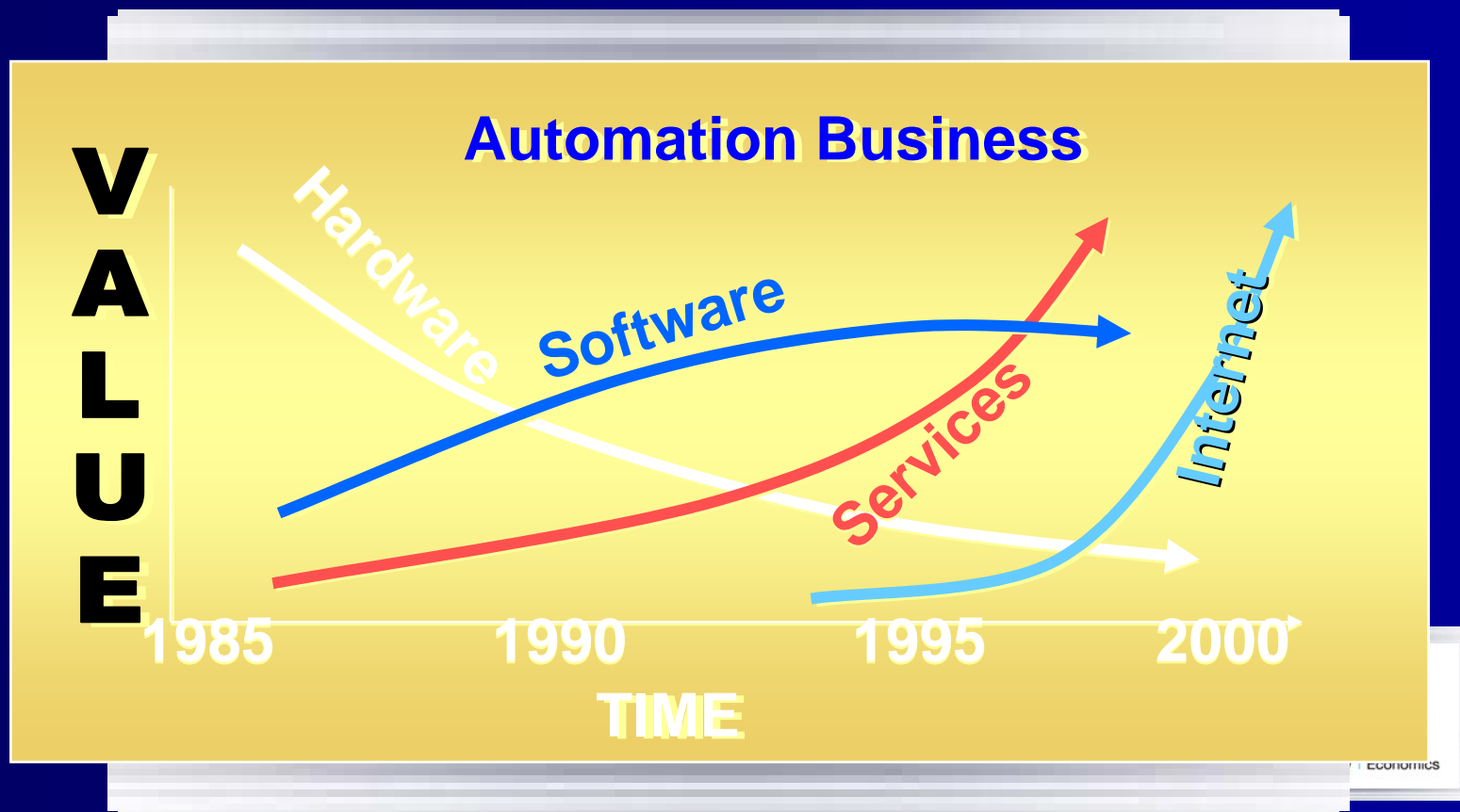
Source: Asset Management (CAM)

Friday, October 06, 2000

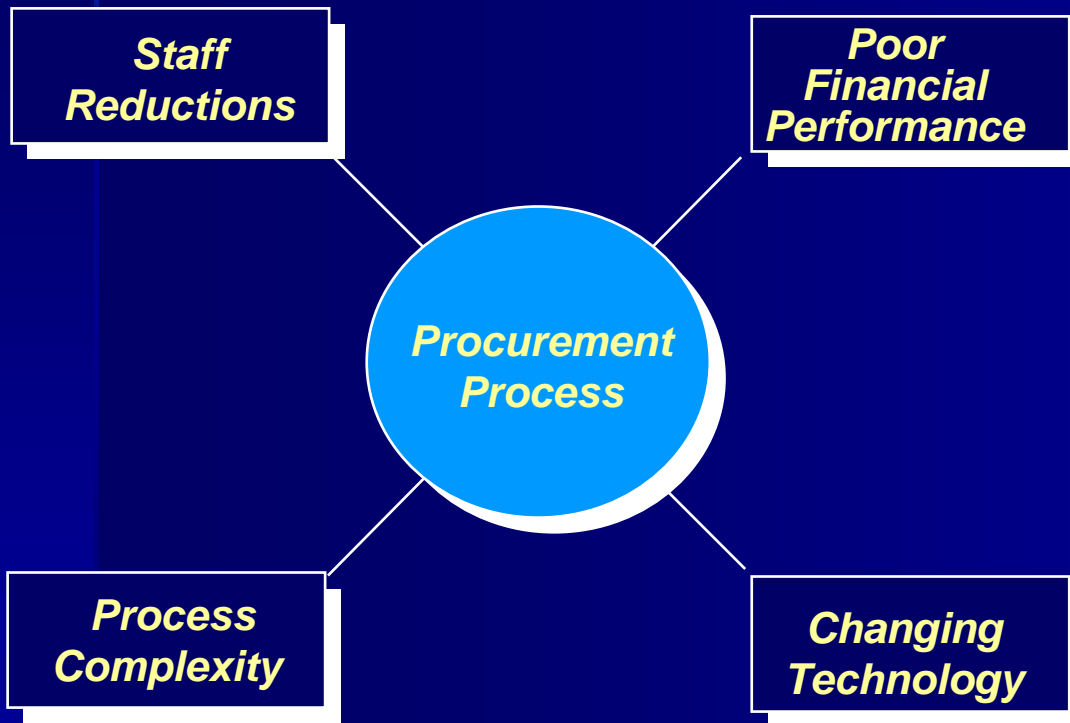
Leif Eriksen

Value Migration

Revenue streams change over time, requiring different business models and sales approaches



Increasingly Complex Buying Process

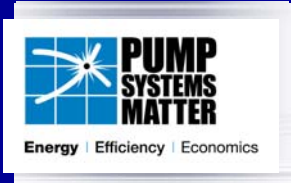


Industry Trends

- Supplier Consolidation
- Rely on Supplier R&D
- Focus on Cost
- Buying Solutions
- Outsourcing

Changing Business Environment

Channel Differentiation
(Value Migration)



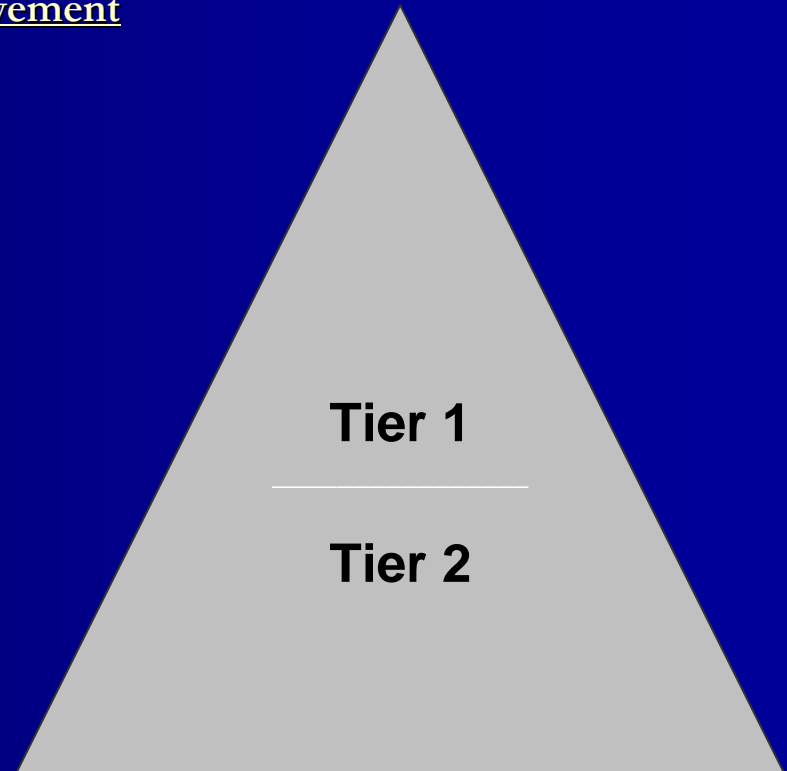
Service vs. Manufacturing: Tier 1 & 2 Functional Areas

Tier 1: Provides Service for Continuous Improvement

- *Assessment*
- *Consultation*
- *Application*
- *Information*
- *Implementation*
- *Education*
- *Systems integration*
- *Self-made products and services*
- *Multi-vendor products and services*

Tier 2: Product Manufacturing and Selling

- *Direct sales*
- *Distributor sales*
- *Third Party*
- *Electronic orders*
- *Internet orders*
- *Telemarketing*
- *Catalogs*
- *Manufactured products and services*



Market Transformation

“The three classical pillars of labor, capital and raw materials no longer underpin the creation of wealth...

...wealth creation today is based on the tripod knowledge, relationships, and entrepreneurship to render *service*.”

William Knoke, President; Harvard Capital Group

The Hyperconnecting Corporation

