MPM Program
Engineering and R&D Perspective

With the Industrial Internet of Wisdom R&D and engineering personnel can help differentiate their products to provide lowest total cost of ownership.

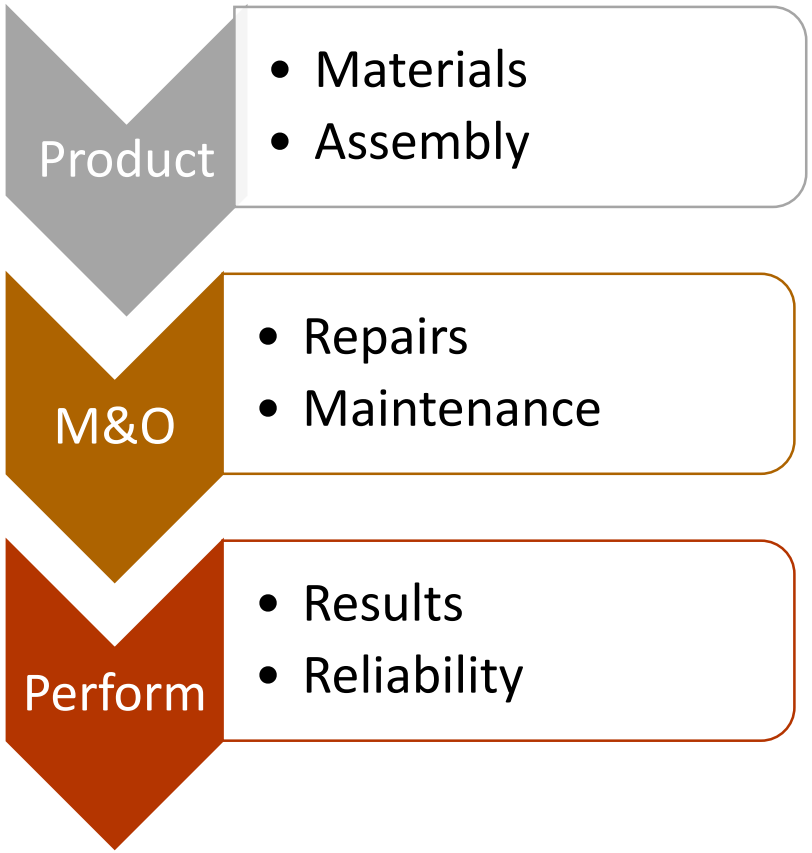
R&D Works with Sales and Engineering to Produce Superior Products with the Benefit of MPM Insights

- Research and development along with the engineering group strive to make the products better. This translates into lowest total cost of ownership.
- The MPM program utilizes decision systems to organize the intelligence needed for analyzing industries, processes, and products relevant to the R&D and engineering efforts.
- The ability of the MPM program to sell superior products at higher prices results in greater funding for R&D and in turn more superior products.
- The program encourages sales, engineering, and R&D to work closely in identifying opportunities and then pursuing them.

McILVAINE

Lowest Total Cost of Ownership is the Goal for R&D and Engineering Efforts

The aggregation of products, industries, geographies and individual purchasers needs to be evaluated in terms of total cost of ownership.
The total cost of ownership varies depending on whether the product is high performance or general performance.
A high performance product is in severe or critical service. These products are generally purchased based on life cycle costs and not initial price.
A general performance product is likely to be purchased based on price or convenience. The initial price plays a large role in total cost of ownership.
Determining the TCO requires knowledge of industries and processes as well as the anticipated performance of the product in the various circumstances.
Ascertaining the lowest total cost of ownership entails an analysis of competitive products.



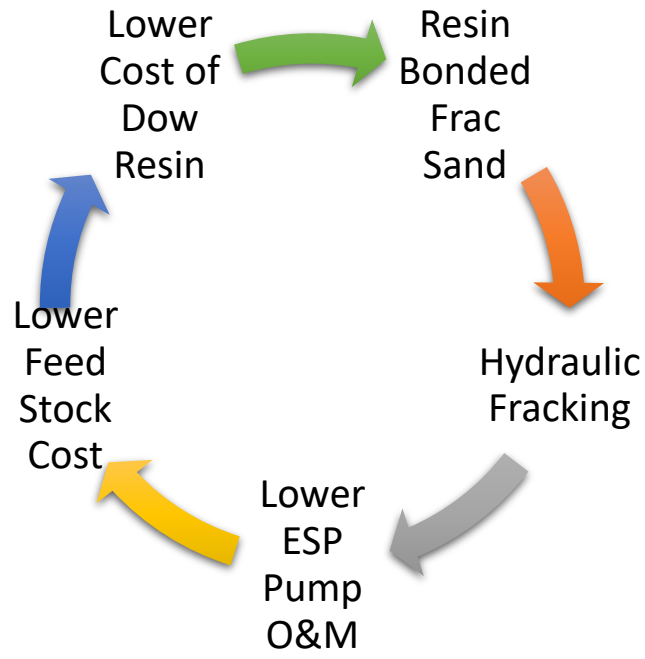
McILVAINE

Process Understanding Needed to Determine Total Cost of Ownership

The determination of lowest total cost of ownership can require knowledge of upstream and downstream processes. A case in point is the selection of pumps for downhole extraction where hydraulic fracturing is being employed. The abrasive sand in the product can cause normal pumps to wear excessively. More expensive designs are available.

Alternatively, resin bonded sand can be utilized and minimize the amount of flowback sand. This changes the total cost of ownership differential between the two.

A further variable is the price of the resin which can also change with lower oil and gas costs.



LTCOV-Lowest Total Cost of Ownership Validation Requires Collaboration Among all Divisions

- Validation of lowest total cost of ownership requires convincing decision makers. The supplier is equivalent to the lawyer making a case to a jury.
- The other side will be making their arguments to counter the supplier.
- The process is sequential and continuous.
- The process is made by multi media: websites, magazine articles, conference speeches, and in person.
- Validation needs to be based on accepted
  - Process variables
  - Labor, downtime, energy and other costs
- Subject matter expert testimony is more convincing if the expert has a body of evidence to support his conclusion.

- Evidence: A good lawyer assembles all the evidence and presents it in a way to support his assertions.
- McIlvaine has created decision guide templates which can be expanded to provide the body of evidence.
- A subject matter expert who helps prepare and then is most knowledgeable about the decision guides becomes subject matter ultra expert (SMUE) and provides the most credible testimony.

McILVAINE

R&D and Engineering Decisions Enhanced by Systematic Intelligence Gathering

- There is a vast amount of useful information which is theoretically available but nearly impossible to access
- The Industrial Internet of Wisdom (IIoW) is the organization of this information in a manner which results in better decision making by the users.
- McIlvaine has been creating decision systems for 40 years
- Suppliers who strive for or have the lowest total cost of ownership products will benefit the most from the world of IIoW

The Industrial Internet of Wisdom

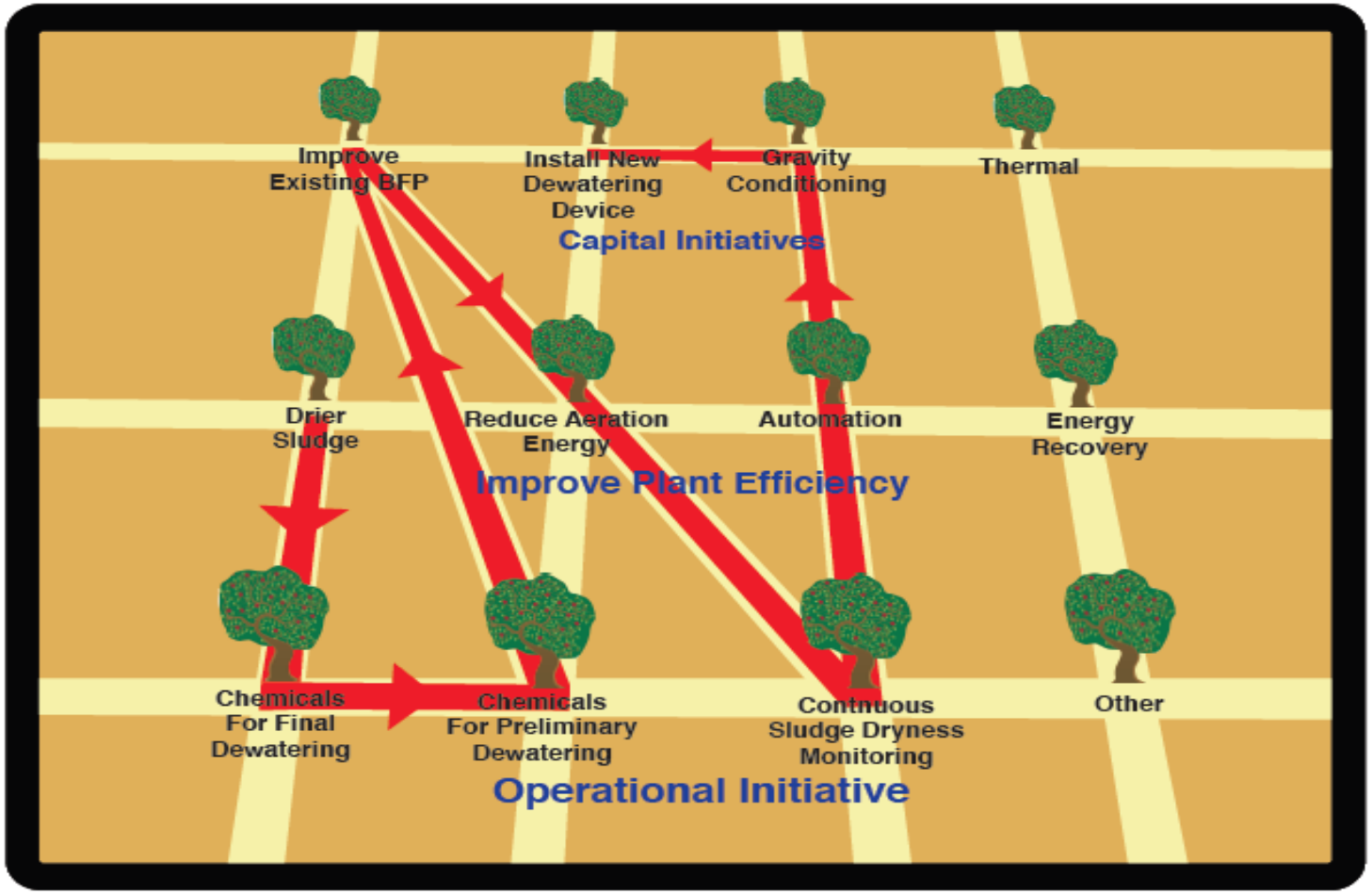
International Filtration News and The McIlvaine Company are collaborating to assist filter purchasers in determining the lowest total cost of ownership products for their unique applications requirements. This partnership begins with the introduction of a new regular editorial column in International Filtration News, "The True Cost," aimed at helping filter users identify the most cost effective equipment solutions over the lifespan of their use.

McILVAINE

Decision Systems take into Account all the Process Options

McIlvaine has a Municipal Wastewater Decisions System which reviews all the options for equipment, chemicals and process selection. In one case the goal may be a drier sludge. In another it might be the reduction of struvite. For WEFTEC 2018 Mcilvaine provided a guide to exhibitors and speakers which was supplemented by links to hundreds of struvite articles

http://home.mcilvainecompany.com/index.php/other-services/27-water/1335-municipal-wastewater-decisions



Monthly Alerts Provide New Insights

Power Alert	GE applying digital twin to coal and gas plants– Insulation is an important factor in maximizing efficiency---Sub bituminous coal conference Asia papers by Korea Energy, B&W, Burns & Mc, KOSEP, Tai & Chyun, Petron, CLP Power, GLOW, Amec, BNF –Improving plant efficiency by capturing waste heat—smart valves & pumps
FGD & DeNOx	Mcilvaine PacifiCorp Webinar # 5 on NOx reduction at Hunter and Huntington-- Catalytic filters with DSI are likely to be the best choice for some utilities.—Emerson silo optimization can achieve NOx levels as low as 0.1 lbs/mm btu—Co-locating municipal wastewater and power plants---Two stage scrubber to separate rare earths
Fabric Filter	LIFO not FIFO if you are capturing SO2 along with particulate—Do membrane bags require special installation skills? Power plants in Chile, Italy, Russia and South Africa are switching from precips to baghouses– Jet pulse or high volume medium pressure cleaning?---FLS has commercial 10 meter catalytic filter bag
Precipitator	Are wet precipitators downstream of the gypsum scrubbers the best upgrade choice for Chinese power plants--Can precipitators meet the new Indian standards– How much efficiency improvement can be achieved by new power supplies?--ESP operating costs are lower with high frequency energization in intermittent mode
Monitoring	BHE Mid American Neal using Hach pH monitors ---ABB wins Vietnam Coal plant expansion contract—Xcel Energy reducing NOx with GE Neuco optimization system—Mercury limits in Europe are following the U.S. –Siemens TDL sensors measure O2 and CO at multiple points in the boiler--- Remote control of power plants is coming

McILVAINE

Intelligence System
(Chinese equivalents being added to the keyword system)

General	Product	Process	companies	Text Descriptor
Business Transactions	Absorber	Acid Gas Removal	A.H. Lundberg Associates	Abstract
Company Information	Activated Carbon 活性炭	Activated Sludge	A.T. Biopower	Analysis
Conditions	Activated Carbon Injection System	Air Filtration	Aalberts Industries N.V.	Article
Conferences	Activated Carbon Conveying	Air Intake 空气进	ABB	Biography
Contaminants	Actuator	Air Monitoring	Acciona Aqua	Case Study
Issues and Options	Adsorber	Air Pollution Control 空气污染控制	Accuseal	Conference
Markets & Forecasts	Advanced Process Control	Air Quality 空气质量	Actuant Corporation	Diagram
Performance & Optimization	Aerobic Digester	Air Staging	ADA-ES	Event Participant
Regulation & Policy	Agitators	Ammonia Injection 氨水加注	Advanced Filtration Concepts	Exhibition
			Advanced Power	Installations
				InterWEBview
				News Release

McILVAINE