SESSION NO.: T2.41 TUESDAY, MARCH 10, 2009 ROOM NO.: 341

The Importance of Reliability in Facilities

Ralph Tileston
Life Cycle Engineering
rtileston@LCE.com

National Facilities Management & Technology
NFMT
March 10-12, 2009 • Baltimore

INCLUDING

NFM&T CONFERENCE/EXPO
Maintenance SOLUTIONS NATIONAL EXPO
GREENTech conference & exposition
SAFE BUILDINGS EXPO

Overview

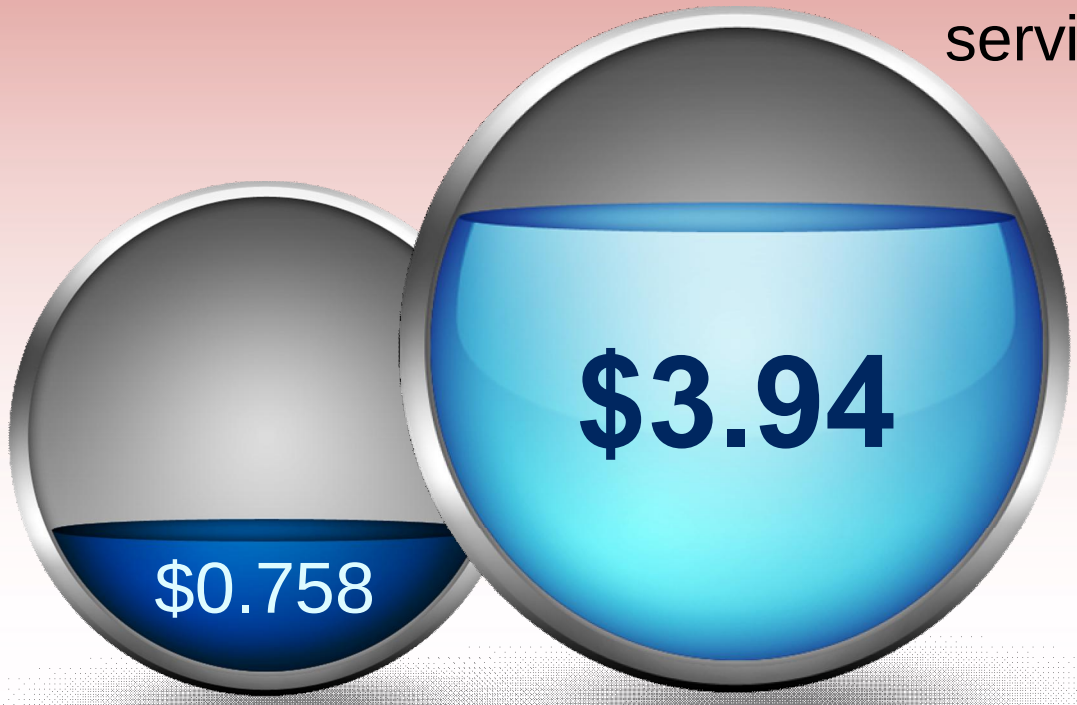
- Why do we think facilities are different?
- Key Industry Measures
  - Business drivers in Facilities
- The Reliability Excellence Model
- Reliability Excellence
  - Hospital Case Study
- Reliability Excellence Real Benefits
- Strategies and Sustainability

Facilities are called different things. . .

- Office buildings
- Warehouses/Distribution centers
- Administrative centers
- Government facilities
- College campuses
- Hospitals and medical facilities
- Hotels
- Retail establishments or shopping malls

Maintenance and Support Cost

Research or critical services facilities



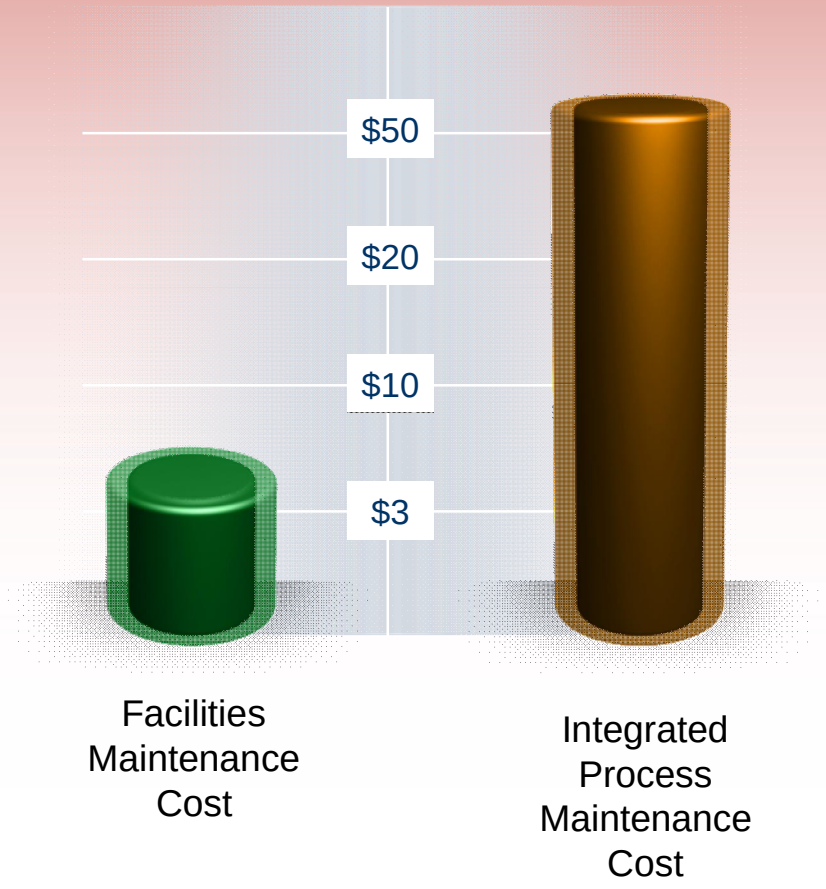
Warehouses, low or no occupancy facilities

Cost per Gross Square Foot

Source: Benchmarks V - IFMA

Facilities vs. Manufacturing

Facilities maintenance and support cost is substantially lower, but is it less important?



Cost per Gross Square Foot

Source: Benchmarks V - IFMA

Best-of-Class By Use Classification

Facility Use	Total Maintenance
Research Center	$3.94
Hospital	$3.70
Education & Training	$2.74
Data Center	$2.66
Call Center	$2.55
Factory (Building)	$2.40
Headquarters	$2.10
Non-Headquarters	$1.91
Multi-Use	$1.86
Warehouse	$0.75

Cost per Gross Square Foot

Source: Benchmarks V - IFMA

Facilities:

Size range ï 750,000 to 6.0MM sf.
Costs/sf. = $0.75 to $3.94
Budget Range: $500K to $24MM

- Versus -

Manufacturing:

Size range ï 200,000 to 750,000 sf.
Costs/sf. = $28 to $55
Budget Range: $5.6MM to $41MM

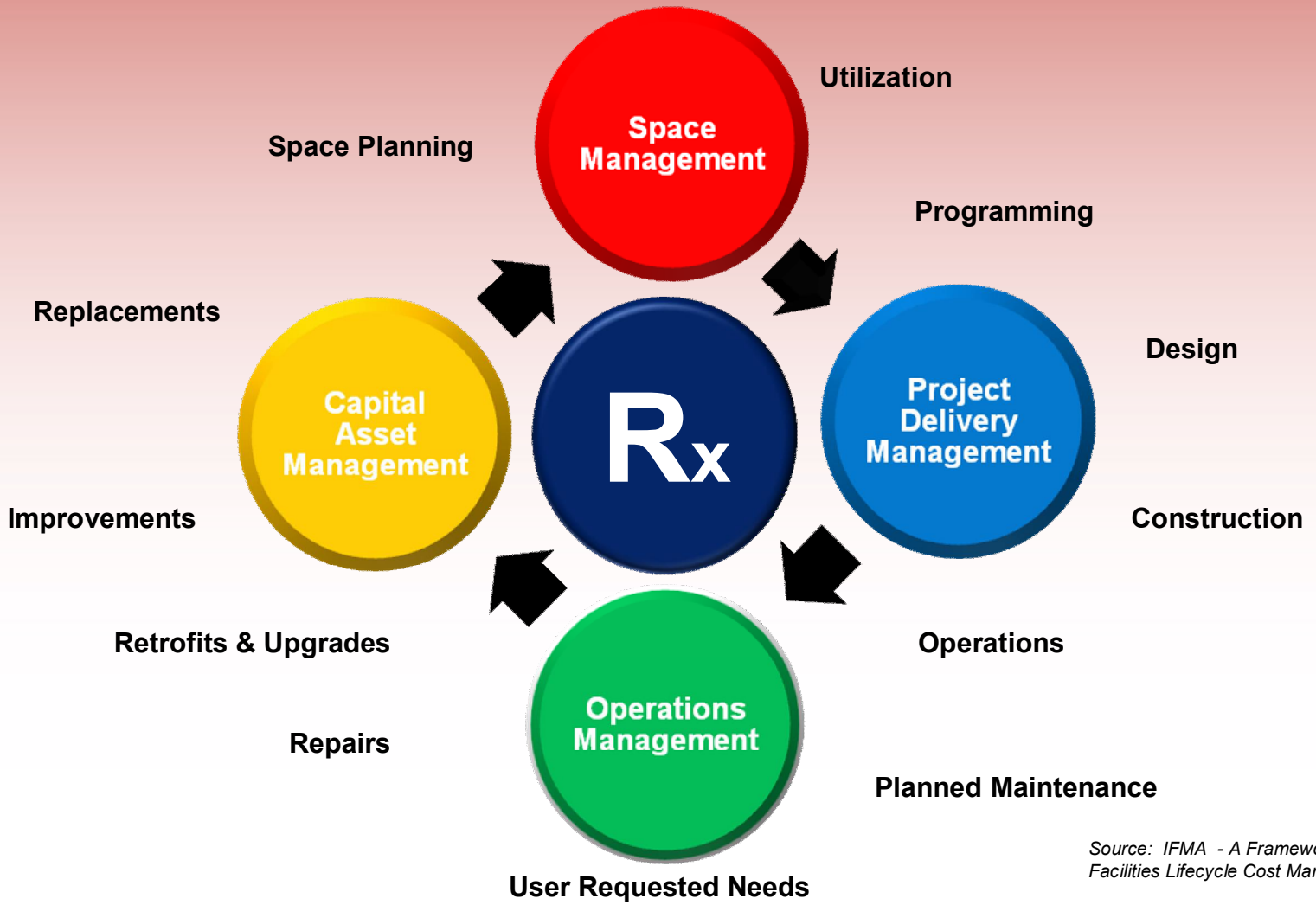
Facilities Opportunity

$0 $10mm $20mm $30mm $40mm

Facili

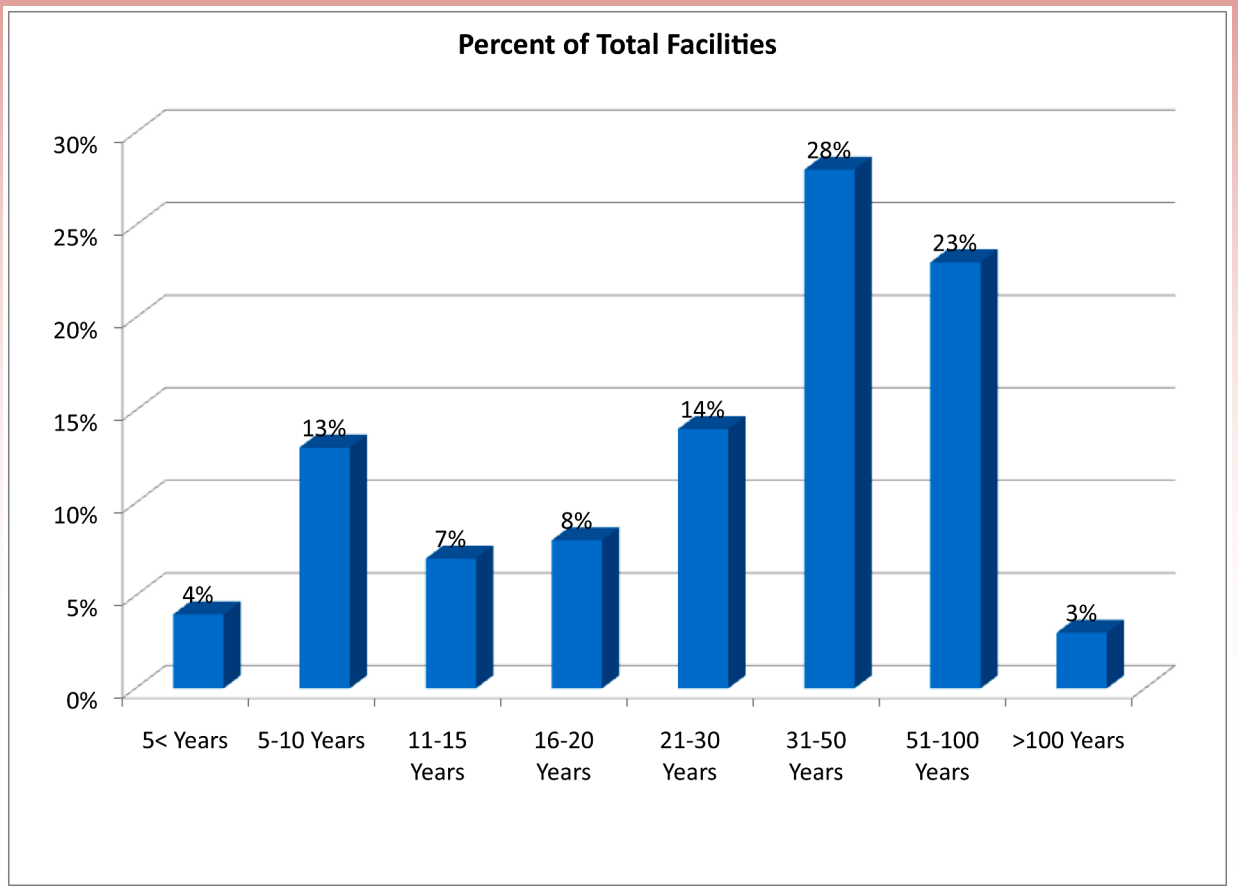
.6mm to 41mm

Total Cost of Ownership



Source: IFMA - A Framework for Facilities Lifecycle Cost Management

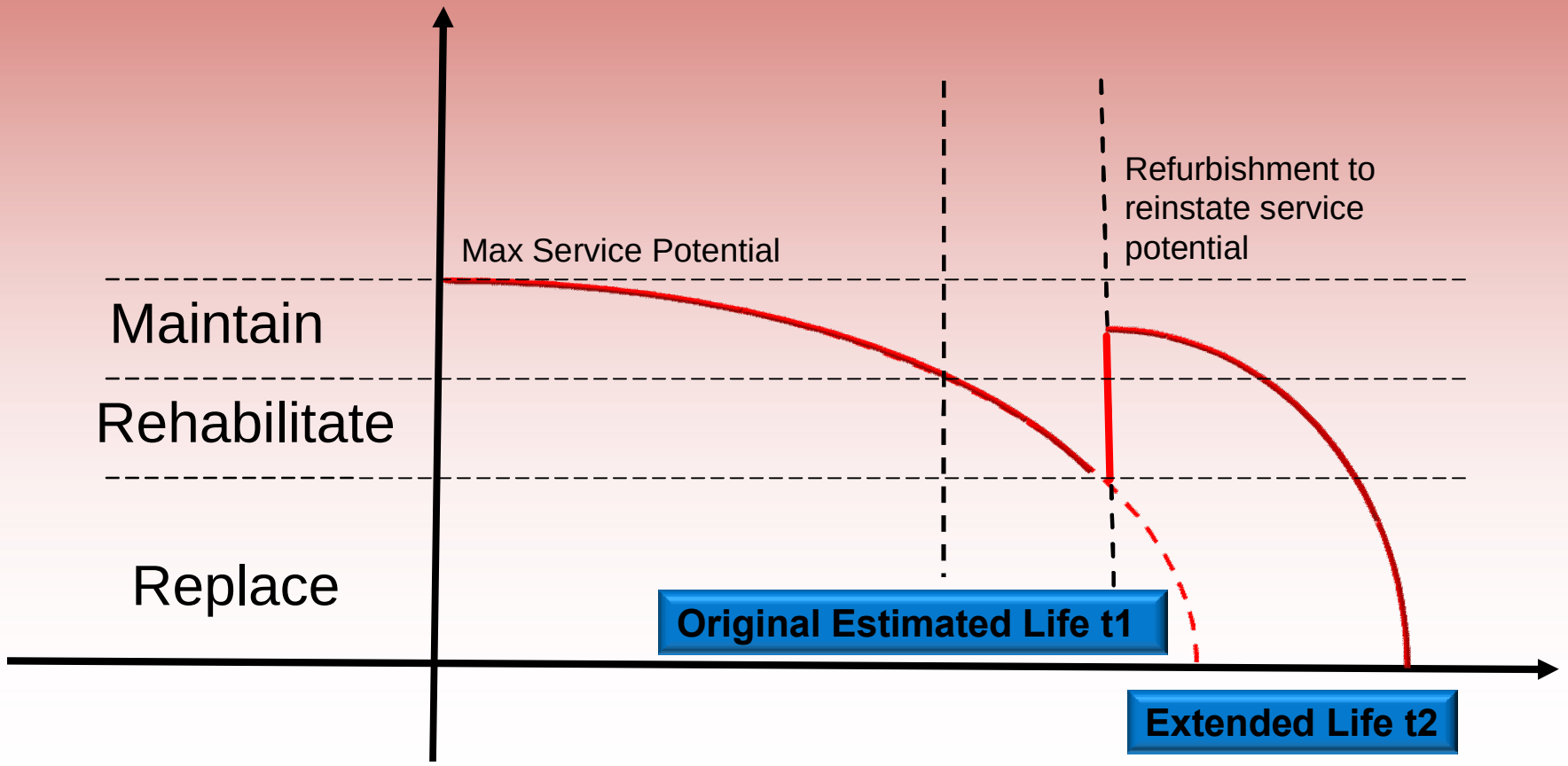
Aging Facilities



Average Facility age is 33 years

Source: Benchmarks V - IFMA

Asset Life Extension



Asset Decay Curve

Source: Plant Performance Group

Operating expectations are still the same

- Space availability
- Ambient comfort
- Total cost of operation
- Environmental health and safety
- Security
- Housekeeping
- Utilities
- Decorating / Remodeling-refurbishment

Background

- Maintenance and reliability efforts are a product of history and culture
  - Reactive and "rewarded"
  - Tribal knowledge recordkeeping
- Legacy "thinking" is a root of many of the current problems
- Outsourcing maintenance does not resolve current economic cost pressures

Legacy Symptoms

- Extraordinary efforts to accomplish routine maintenance items
- Parts and supplies are all over the place
- Increasing maintenance costs without supporting data
- Unhappy customers, missed calls, lots of blame
- And why do we accept it???

Are You Reactive?

- Mechanics utilization less than 30%
- Little cooperation between operations and maintenance
- No ñroot causeò approach to problem solving
- Existing PMôs specify verbatim OEM recommendations
- There is no use of Planning and Scheduling practices
- No effective performance measures (KPIs) or review process

There is a Better Way!

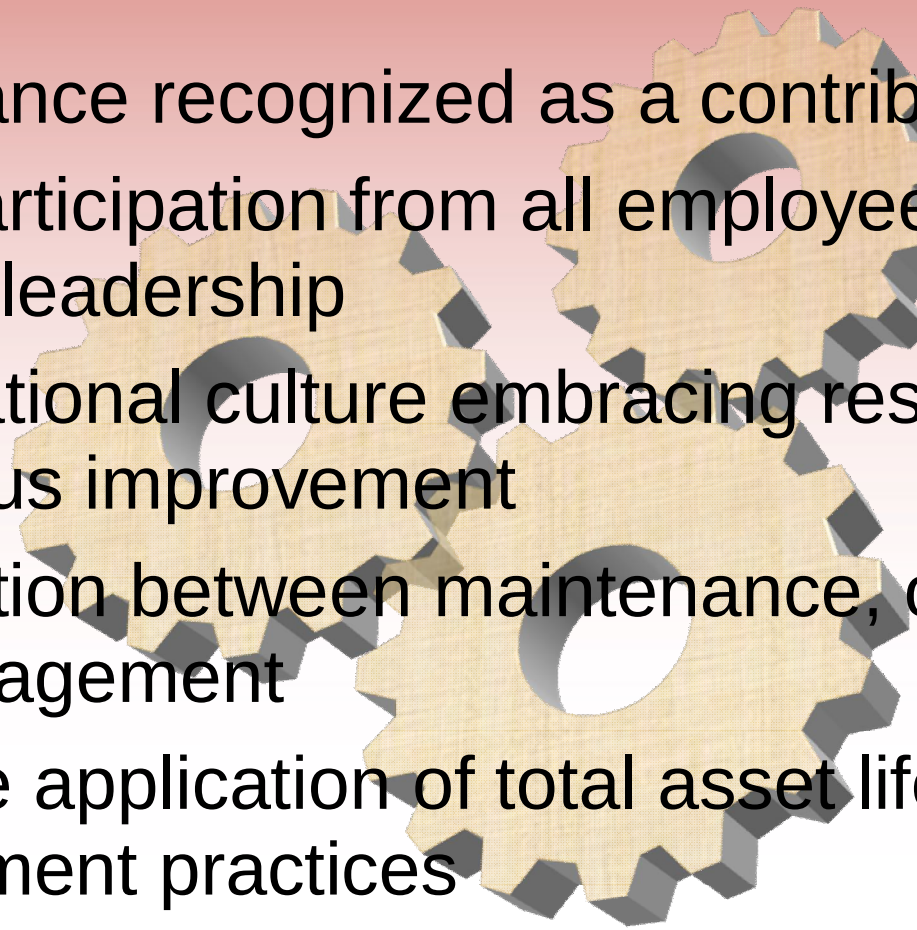
- Better service without heroics
- Better asset health and care
- Reduced costs for entire operation
- Whether itôs contracted or in-house, there is a better way. . .

- Hereôs how. . .

Moving to a New Level

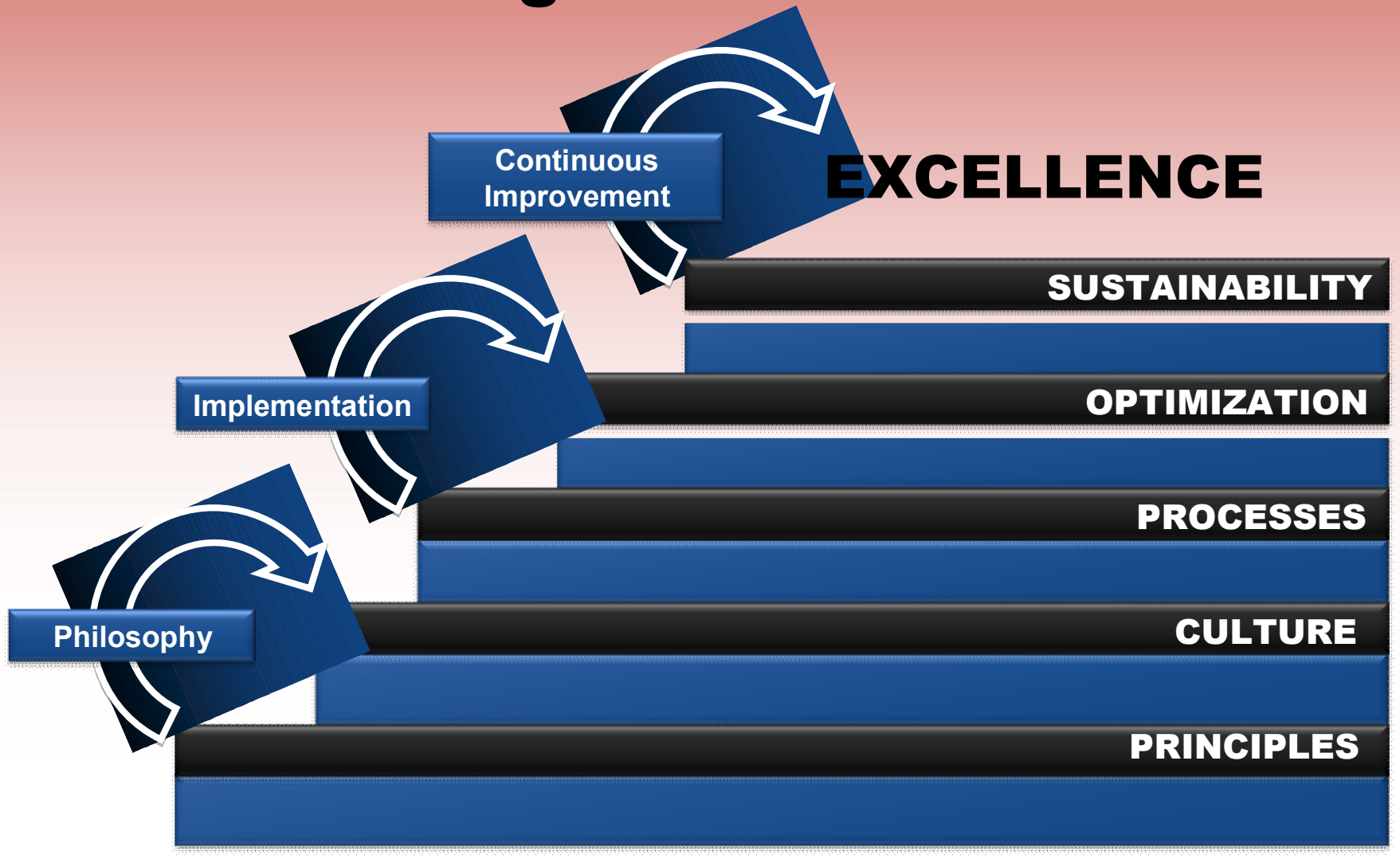
RELIABILITY EXCELLENCE

What is Reliability Excellence?



- Maintenance recognized as a contributing resource
- Active participation from all employees, including top level leadership
- Organizational culture embracing responsibility and continuous improvement
- Cooperation between maintenance, operations, and management
- Proactive application of total asset life cycle management practices
- Educated, trained, flexible workforce

Understanding The Excellence Model



The Reliability Excellence Model

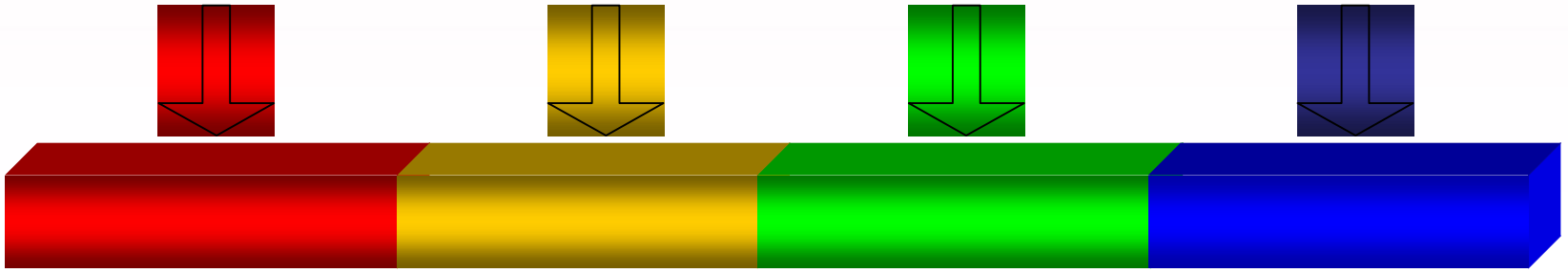
Reliability Excellence Performance Levels

Excellence ï All functional groups enterprise wide are aligned and focused on a long term philosophy of processes, people, and problem solving excellence

Proactive ï Maintenance and Operations form a partnership to care for facility assets

Emerging ï Maintenance remains the asset owner but Operations dictates the service plan

Reactive ï Maintenance is a service organization and Operations is impacted by breakdowns



Key Elements of Reliability

- Key Performance Indicators (KPIôs)
- Work Management
- Reliability Engineering
- Materials Management
- Operational Excellence

Case Study

Facility Type: Hospital

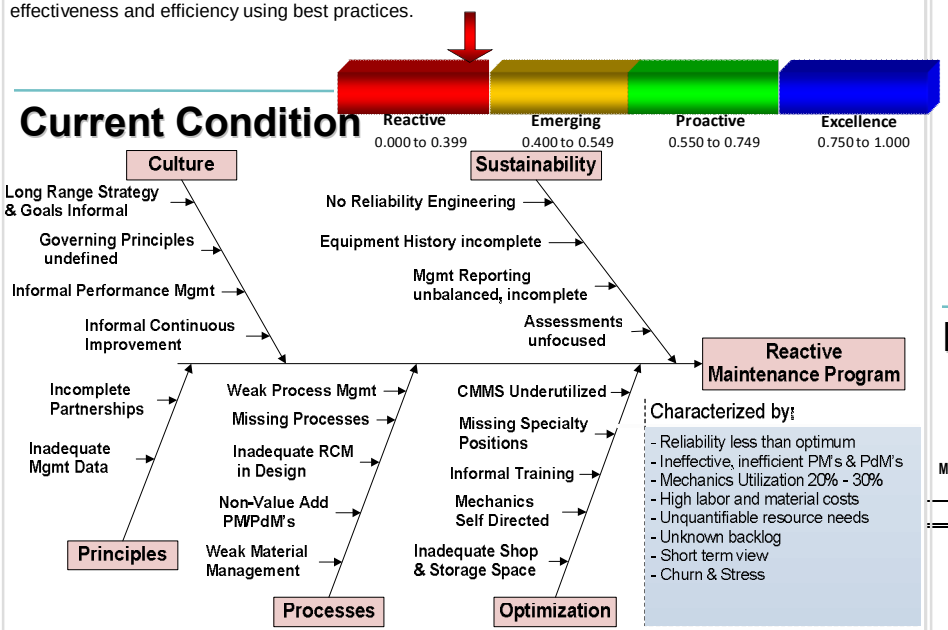
A3 PROPOSAL: Hospital Reliability Excellence

Updated: December 3, 2008

Background

Å Maintenance problems were identified within this hospital.
Å The Hospital partnered with Life Cycle Engineering to assess maintenance program.
Å An assessment was completed July 2008.
Å Assessment Score : 241 (REACTIVE)
Å The Maintenance program was found to be operating in a reactive mode, not taking advantage of best practices in facility maintenance management, and incurring unnecessary costs.
Å Recommended refocusing programs on Reliability and to re-engineer the programs to increase effectiveness and efficiency using best practices.

Current Condition

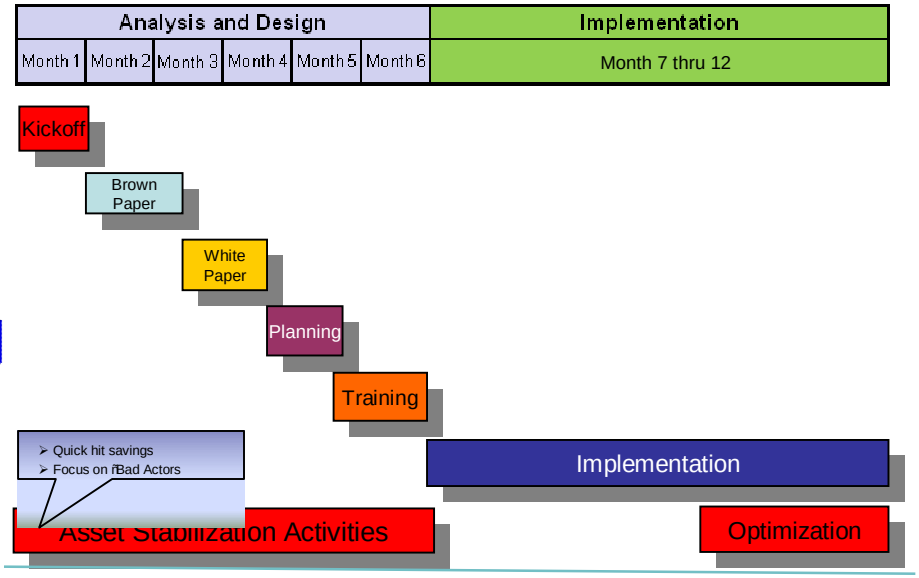


Path Forward

Å **Re-engineer system to create reliability with Rx best practices**
Å **Two facilities in parallel building standard processes**
Å **Establish Specialist roles: (move from existing workforce)**
- (2) Reliability Engineers (RE)
- (2 to 3) Planner/Schedulers (P/S) per site (1 P/S per 20 mechanics)
- (1 or 2) Procurement Specialist per site
- (1) Warehouse person / Kitter per site

Å **Goals:**
- Increase Mechanic Utilization (Wrench Time) to 50%
- 10% reduction in PM labor costs
- 12% reduction in material costs
- Reliability focus vs. Maintenance focus
- Schedule attainment to 95%
- Cost per ft² improvement from $5.25 to $3.75

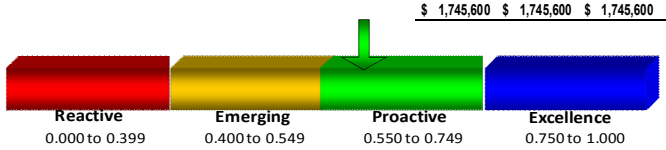
Implementation Plan



Business Case

		Annual Opportunity		Total '07	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	Labor Utilization				25%	50%	75%	100%	100%	
	Materials Improvement				20%	30%	40%	75%	100%	
Labor Utilization	$	1,598,000	40% imp'mt	$ 3,995,000	$ 399,500	$ 799,000	$ 1,198,500	$ 1,598,000	$ 1,598,000	$ 5,593,000
Materials Improvement	$	147,600	12% Imp'mt	$ 1,230,000	$ 29,520	$ 44,280	$ 59,040	$ 110,700	$ 147,600	$ 391,140
Opportunity	$	1,745,600		$ 5,225,000	$ 429,020	$ 843,280	$ 1,257,540	$ 1,708,700	$ 1,745,600	$ 5,984,140
					$ 429,020	$ 1,272,300	$ 2,529,840	$ 4,238,540	$ 5,984,140	
ROI					0.3 : 1	0.9 : 1	1.8 : 1	3 : 1	4.2 : 1	

Total Potential Opportunity					
Utilization	$ 1,598,000	$ 1,598,000	$ 1,598,000	$ 1,598,000	$ 1,598,000
Material savings	$ 147,600	$ 147,600	$ 147,600	$ 147,600	$ 147,600
	$ 1,745,600	$ 1,745,600	$ 1,745,600	$ 1,745,600	$ 1,745,600	$ 8,728,000



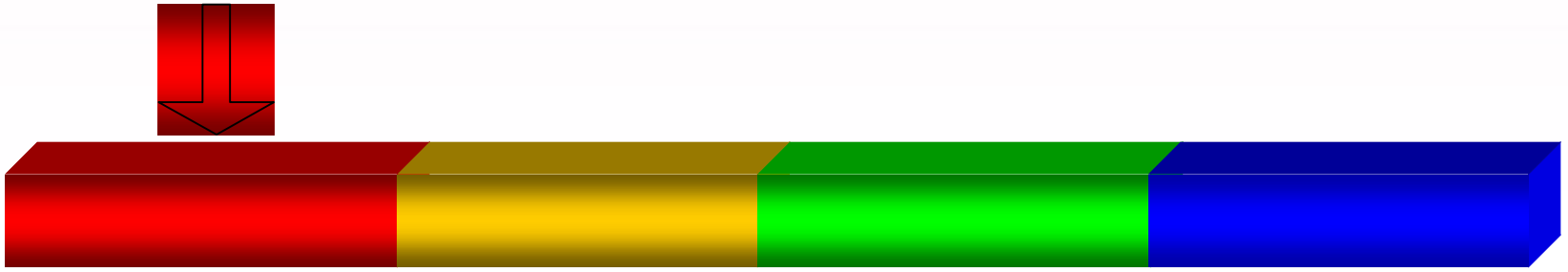
Unresolved Issues & Risk

Å Process re-engineering with O&M contractor roles (Specialists)
Å Timely recruiting Reliability Engineer functions
Å Wave III staffing vs. schedule vs. quantifiable results
Å CMMS upgrade/support for Rx and timeliness
Å Leadership support during program implementation

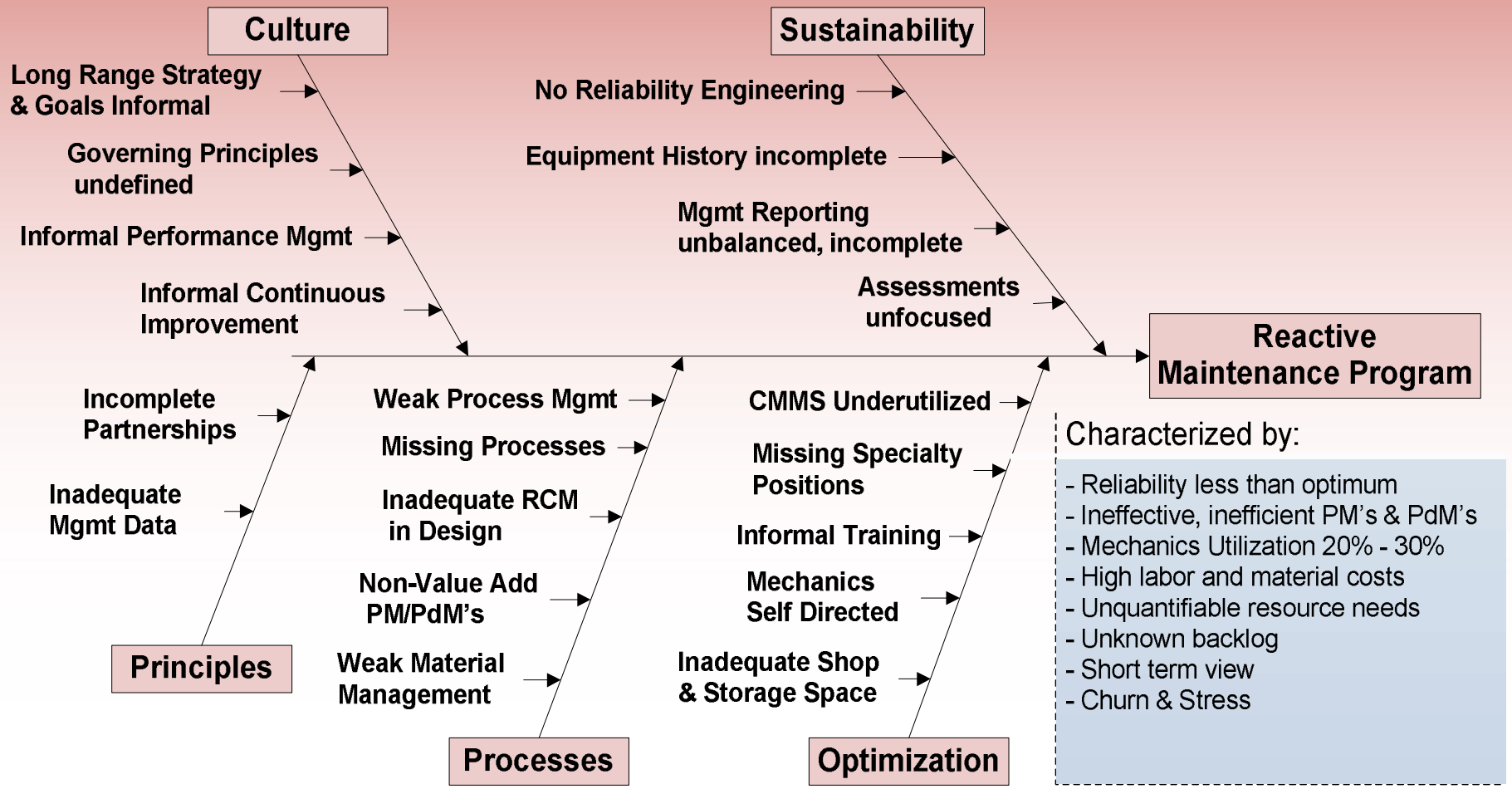
rx powered by RELIABILITY EXCELLENCE

Background

ÅMaintenance problems were identified within this hospital.
ÅThe Hospital partnered with Life Cycle Engineering to assess maintenance program.
ÅAn assessment was completed July 2008.
ÅAssessment Score : 241 (REACTIVE)
ÅThe Maintenance program was found to be operating in a reactive mode, not taking advantage of best practices in facility maintenance management, and incurring unnecessary costs.
ÅRecommended refocusing programs on Reliability and to re-engineer the programs to increase effectiveness and efficiency using best practices.



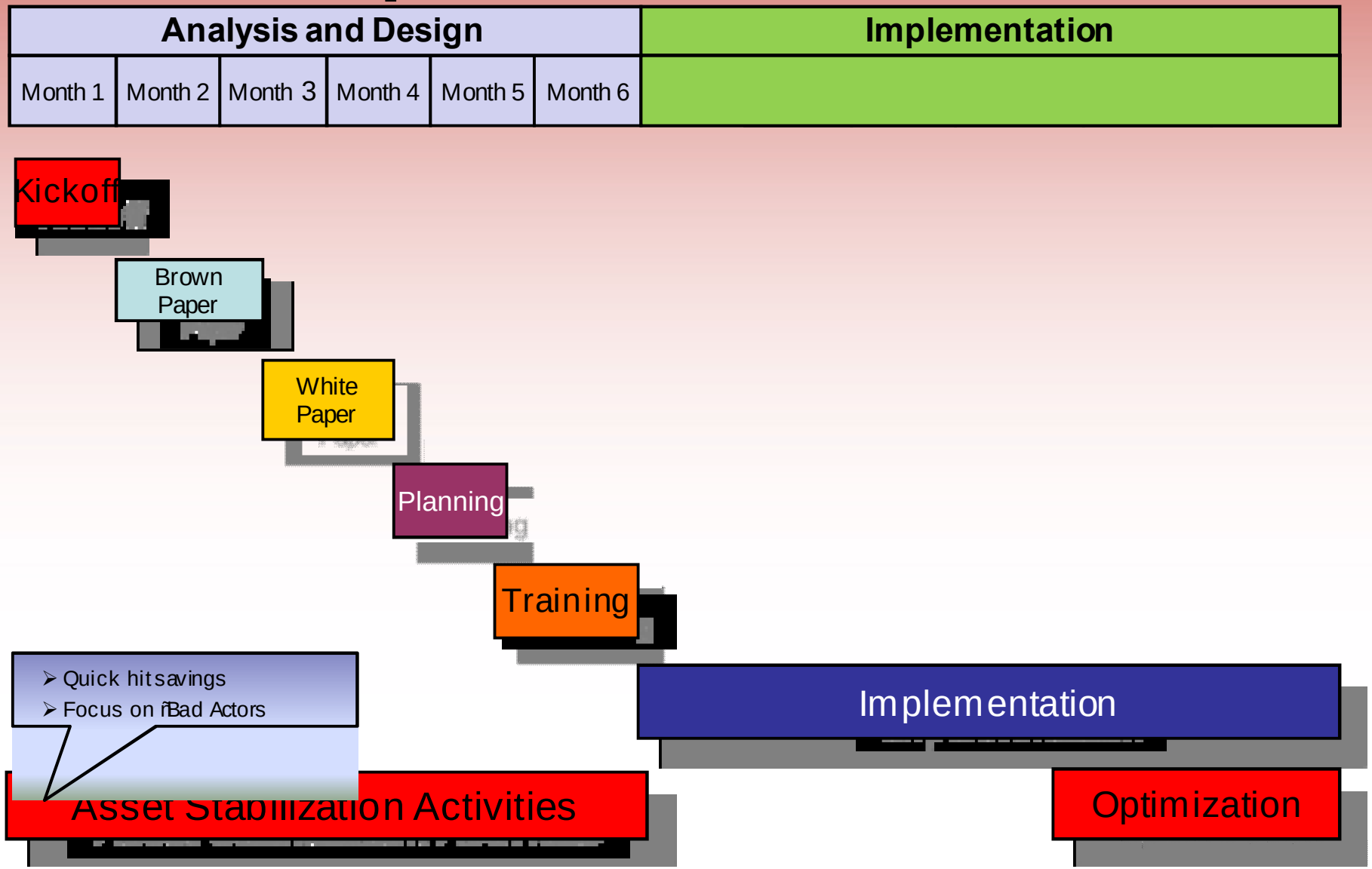
Current Condition



Path Forward

- **Re-engineer system to create reliability with Rx best practices**
- **Two facilities in parallel building standard processes**
- **Establish Specialist roles: (move from existing workforce)**
  - (2) Reliability Engineers (RE)
  - (2 to 3) Planner/Schedulers (P/S) per site (1 P/S per 20 mechanics)
  - (1 or 2) Procurement Specialist per site
  - (1) Warehouse person / Kitter per site
- **Goals:**
  - Increase Mechanic Utilization (Wrench Time) to 50%
  - 10% reduction in PM labor costs
  - 12% reduction in material costs
  - Reliability focus vs. Maintenance focus
  - Schedule attainment to 95%
  - Cost per ft^2 improvement from $5.25 to $3.75

Implementation Plan



Business Case

	Annual Opportunity		Total '07	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Labor Utilization				25%	50%	75%	100%	100%	
Materials Improvement				20%	30%	40%	75%	100%	
Labor Utilization	$ 1,598,000	40% imp'mt	$ 3,995,000	$ 399,500	$ 799,000	$ 1,198,500	$ 1,598,000	$ 1,598,000	$ 5,593,000
Materials Improvement	$ 147,600	12% Imp'mt	$ 1,230,000	$ 29,520	$ 44,280	$ 59,040	$ 110,700	$ 147,600	$ 391,140
Opportunity	$ 1,745,600		$ 5,225,000	$ 429,020	$ 843,280	$ 1,257,540	$ 1,708,700	$ 1,745,600	$ 5,984,140
				$ 429,020	$ 1,272,300	$ 2,529,840	$ 4,238,540	$ 5,984,140	

ROI	0.3 : 1	0.9 : 1	1.8 : 1	3 : 1	4.2 : 1

Total Potential Opportunity						
Utilization	$ 1,598,000	$ 1,598,000	$ 1,598,000	$ 1,598,000	$ 1,598,000	
Material savings	$ 147,600	$ 147,600	$ 147,600	$ 147,600	$ 147,600	
	$ 1,745,600	**$ 1,745,600**	**$ 1,745,600**	**$ 1,745,600**	**$ 1,745,600**	**$ 8,728,000**

Unresolved Issues & Risk

- Process re-engineering with O&M contractor roles (Specialists)
- Timely recruiting Reliability Engineer functions
- Wave III staffing vs. schedule vs. quantifiable results
- CMMS upgrade/support for Rx and timeliness
- Leadership support during program implementation

So Why is Reliability Important?

Real Benefits Created by Rx

Benefits

- Reduced failures
- Increasing capacity/availability
- Improved resource planning
  - Utilization gains
- Lower total cost of ownership
- Cope with increasing workloads
  - Aging structures and more demand
  - Reduced workforce (availability)
- Supports corporate goals
- Sustainability

Goals

- Reliability
  - Increased availability
  - Increased MTBF
  - Increased Asset Utilization
- Mechanic Utilization: 68%
- Schedule Compliance: ≥ 95%
- Reduced PM Labor: 30%
- Reduced Material Costs: 10%
- Facility Condition Index < 10 - 15%

Soft Benefits Created by Rx

- Support growth objectives
- No more surprises!
- Improved organizational effectiveness
- Less chaos
- Manage based on facts and a process vs. "gut feel"
- Less employee turnover
- Safety built into the process and culture
- Training and development

Strategic Vision

Reliability is Key

Å Assets

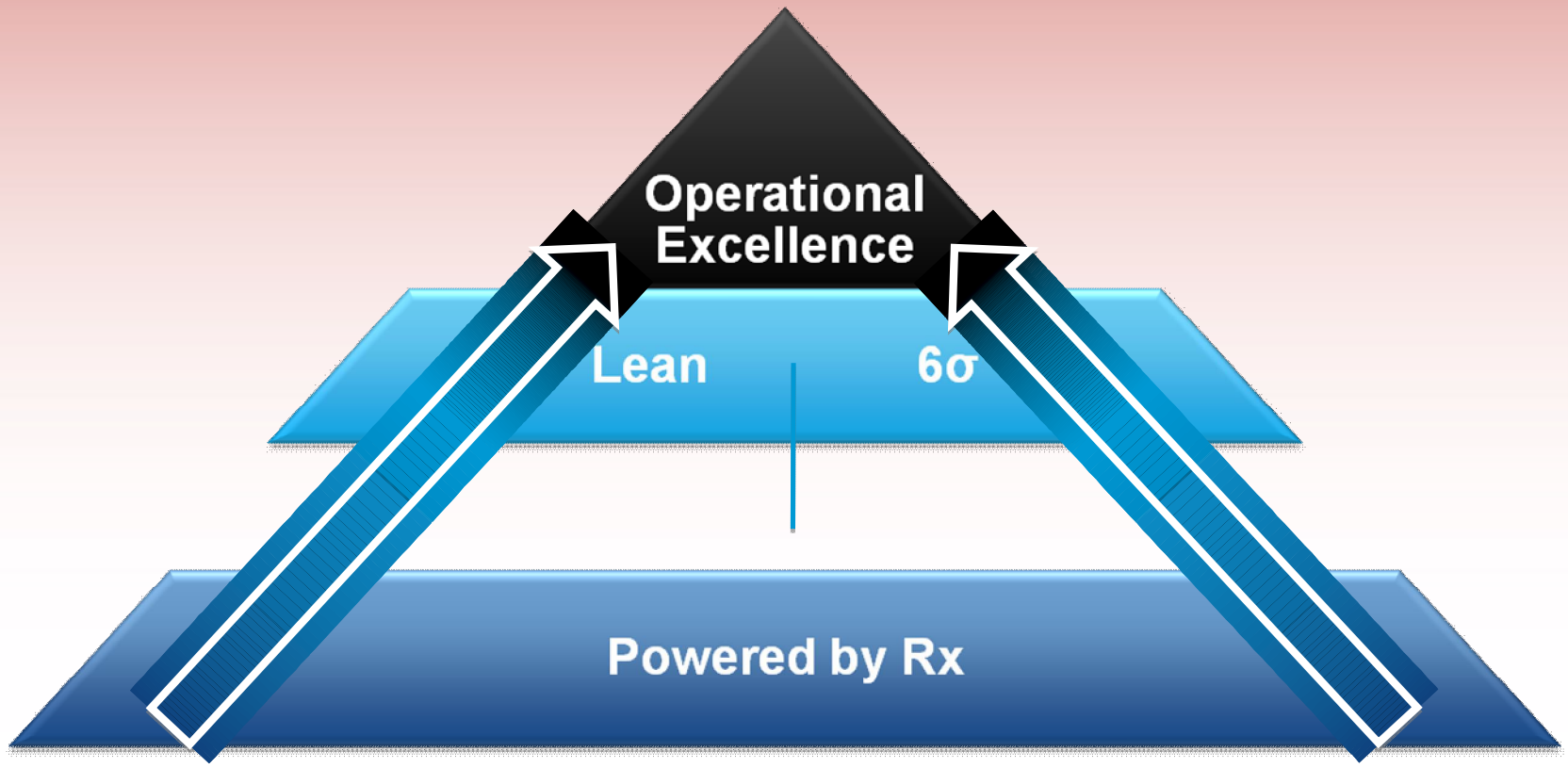
Å Work processes

Reliability is a Business Process

Å Assets and resources effectively utilized

Å Costs managed and controlled

Sustainable success



Sustainable Best-of-Class is Possible

Reliability Excellence

- *Provides a stable foundation*
- *Reliable assets and processes*
- *Culture change and involvement*
- *Continuous Improvement*

The Three Keys to Success