

### Pumps and Motors Word Search

ANSWER KEY

CURRENT

DYNAMIC

WITTINGS

FRITITION

HYDRAULIC

INDUCTION

CORUSE

NOTES

PROCESSE

PRESURE

POPS

RESISTANCE

ROTOR

STATIC

STATICS

SYNCHRONOUS

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## Asset Management Program Small System Sustainability

1:20P - 2:15  
10/21/15

IACC 2015 Annual Conference S-28  
Wenatchee, WA

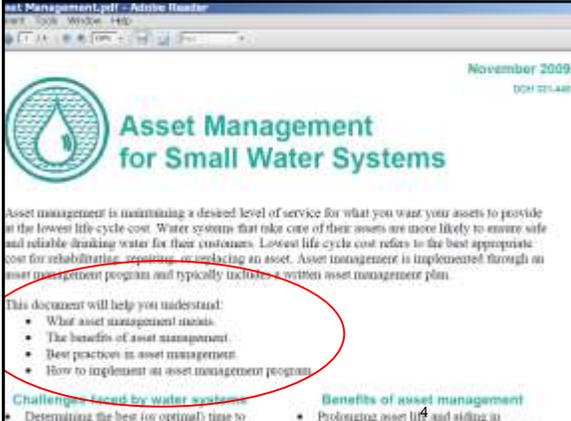



## Welcome!



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### Asset Management for Small Water Systems

Asset management is maintaining a desired level of service for what you want your assets to provide at the lowest life-cycle cost. Water systems that take care of their assets are more likely to ensure safe and reliable drinking water for their customers. Lowest life cycle cost refers to the best appropriate cost for rehabilitating, repairing, or replacing an asset. Asset management is implemented through an asset management program and typically includes a written asset management plan.

This document will help you understand:

- What asset management means.
- The benefits of asset management.
- Best practices in asset management.
- How to implement an asset management program.

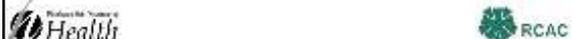
Challenges faced by water systems: • Determining the best (or optimal) time to

Benefits of asset management: • Prolonging asset life and saving m



### Need-To-Know Definitions

- **Asset** - an infrastructure item that has value and provides or will provide some future benefit to the system and/or its customers.
- **Life Cycle Costs** - the total cost of owning an asset over the estimated period that asset is expected to be useful.
- **Asset Management** - a system for managing infrastructure assets to optimize performance, minimize total life cycle costs and reduce risk of asset failure using a combination of management, financial and informational tools.




### Need-To-Know Definitions

- **Depreciation** - the process of spreading out the cost of an asset over the useful life of that asset and accounting for its reducing value over time.
- **GASB (Governmental Accounting Standards Board)** - an organization that sets standards for financial accounting and reporting by state and local governments.
- **GASB 34** - a standard issued in 1999 establishing requirements for reporting on the value of governmentally-owned assets and the cost of deferred maintenance.



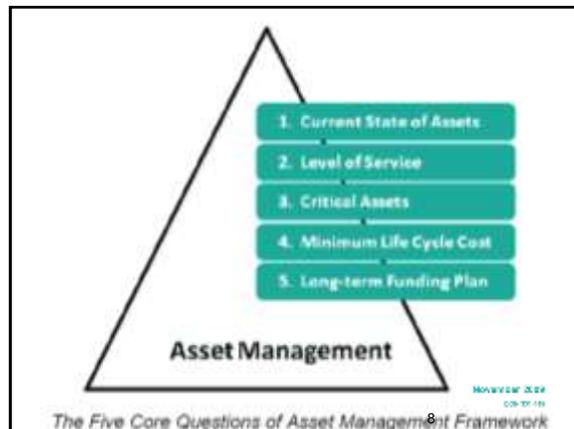


### Assets

What is an asset?.....

- All your 'stuff'; pipes, pumps, computer programs, furniture, rolling stock, valves, motors, buildings etc.
- Two categories:
  - Short lived – generally replaced via **CASH**
  - Long lived (Capital assets) – generally **financed**; can be cash






### Asset Management (AM) includes:

- Maintenance
- Planning
- Finance & Rates
- Public Relations
- Personnel & Training

**NONE stand alone!**





### Asset Management (AM) includes:

- Maintenance
- Planning
- Finance & Rates
- Public Relations
- Personnel & Training

**Which do you think is more important?**





### Asset Management (AM) includes:

- Maintenance
- Planning
- Finance & Rates
- Public Relations
- Personnel & Training

**A well trained & stable work force**

Board / Council as well!!!!....





### My Opinion...

- **No such thing as "Too much PR"**
- You cannot have "Too much data"
- There's a large investment in good personnel .....keep them!
- #1 Lesson: Be pro-active...Plan ahead!






### Good management comes with a Price!...

What are the two questions you must always be able to answer?

**Why should we do this?**  
**What's it going to cost?**

Customers don't need to "like" the answer!




### #1 Current State of Assets

- Prepare an asset inventory and system (facility) map
- Identify condition and importance of assets
- Assess useful life
- Determine asset values and replacement costs





### Asset Inventory

- Identify number/feet/type of all important components in your utilities
  - Year Installed
  - Useful Life
  - Condition
  - Original or replacement Cost

}

NO FIBBING!




### Collecting Data... ...hardest part!

- Water System Plans
- Bid/Construction documents
- Facility maps / "As-builts"
- Walk the line
  - Wheel or pace yardage
  - Count valves, hydrants etc.



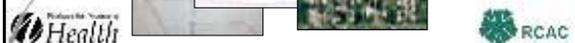

### Collecting Data... ...hardest part!

- Talk to DOH – construction approvals
- Talk to the contractors
- Talk to "old timers"
- Previous operators
- Your experience and observation




### Create a Facilities Map

- Google Earth
- County GIS
- Draw and scale a large piece of paper
  - NO Napkins!



## #2 Level of Service (LOS)

### What is LOS?

- A policy decision to provide an “amount” of service to meet:
  - 1**  Reliability and safety of utilities
    - Future needs
    - Customer needs / wants
  - 2**  Financial Viability

What is the order of the above?





## Level of Service

### Examples:

<ul style="list-style-type: none"> <li>■ No violations</li> <li>■ Admin/OP rules</li> <li>■ Backup generator</li> <li>■ Emergency plans</li> <li>■ Well trained personnel</li> <li>■ Nice truck w/emblem</li> <li>■ Clean facilities</li> <li>■ <b>Your own backhoe</b></li> </ul>	<ul style="list-style-type: none"> <li>■ Phone answered in 3 rings</li> <li>■ Good water pressure</li> <li>■ System performance</li> <li>■ Repair parts on-hand</li> <li>■ Growth planning</li> <li>■ Public Relations</li> <li>■ Rates</li> </ul>
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## #3 Critical Assets

### Which assets are critical to sustained performance?

- Determine Criticality & Analyze Consequences
  - Vulnerability Analysis
    - VA - Identifies vulnerability from intrusion, terrorism, storms, flooding, earthquakes etc.
  - Emergency Response Planning
    - ERP – What you are going to do about it?
    - Who does what & phone numbers
- What's the probability of failure?
  - Past history
  - Age & Condition
  - Trends





## #3 Critical Assets

### Which assets are critical to sustained performance?

- What's the probability of failure?
  - Past history
  - Age & Condition
  - Trends





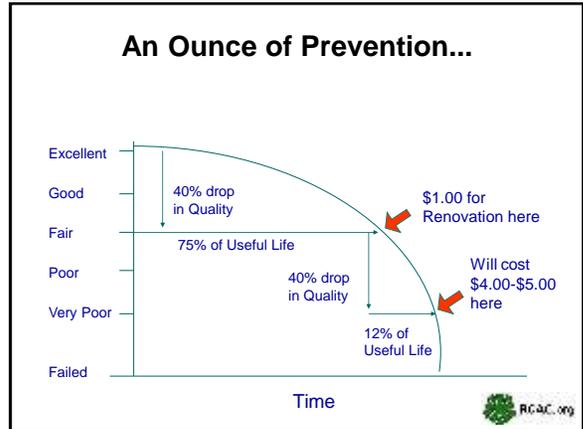


### #4 Minimum Life Cycle Cost

- Scheduled Maintenance
  - Proactive vs. Reactive vs. Predictive
- Recordkeeping (trends)
- Planning
  - Financial
  - Contingency

### Planning

- DO I:
  - Run to failure
  - Replace prior to failure
  - Refurbish
- Refurbish or replace
  - Compare cost to do either
  - Compare "life gained"
  - Figure savings from improved performance (less electricity use etc)
- IGEA



### Understanding how our assets fail

Managing asset deterioration

"Failure is...the inability of any asset to do what users want it to do."  
John Moubrey

### ENERGY EFFICIENCY ANALYSIS - INSTALLED ENERGY EFFICIENT MOTORS, VFDs, MOTOR

Community, Washington WWSIP Calculations

Legend: Input Input data in the yellow cells

Date of Calculation:

Assumed Savings Based On:

- \$ 0.098 /kWh, Average Cost of Electricity
- 24 Number of Operating Hours per Day
- 365 Number of Operating Days per Year
- 75% Estimated Loading Factor

Motor	HP	Est Annual Energy (kWh)	Est. Loading Factor	Pre- Retrofit		Post- Retrofit		Power Savings		Annual Energy Savings (\$/yr)
				Efficiency	Full Load Amps (FLA)	Efficiency	Full Load Amps (FLA)	FLA (Amps)	FLA (Amps)	
1	1.0	8760	75%	88%	3.39	0.74	88.5%	2.87	0.46	2,896
2	1.5	13140	75%	77%	1.42	1.08	88.5%	1.29	0.97	1,049
3	2.0	17520	75%	79%	1.89	1.41	88.5%	1.72	1.29	1,026
4	3.0	26280	75%	81%	2.79	2.07	88.5%	2.50	1.86	1,724
5	3.0	26280	75%	82%	4.30	3.41	89.5%	4.17	1.13	2,554
6	7.5	67680	75%	84%	9.84	5.00	91.7%	8.05	4.98	5,075
7	10.0	90240	75%	85%	8.70	5.59	91.7%	8.04	6.10	6,423
8	15.0	135360	75%	86%	13.01	8.76	93.0%	12.01	8.98	9,821
9	20.0	180480	75%	87%	17.13	12.08	93.0%	16.84	12.03	13,285

### #5 Long-term Funding Plan

- Inventory your assets!
- Determine needed reserve cash accounts
  - Short term asset replacement
  - Cash components of capital projects: such as preliminary engineering
- Determine likely loan sources
- Translate the above into rates!





### #5 Long-term Funding Plan System Reserves

What presents a better "picture bubble"?

Water Reserve Fund : \$110,000

**We can't possibly need this much money!!**



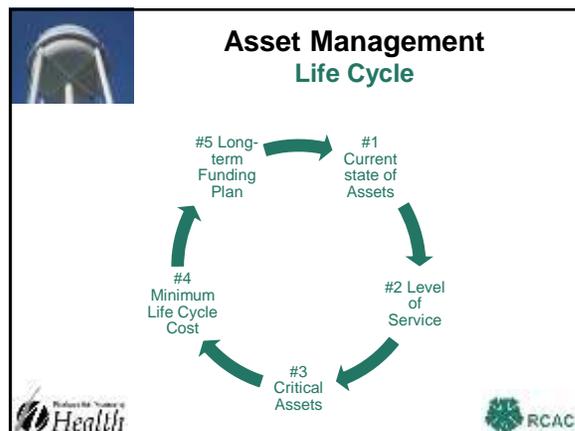


### #5 Long-term Funding Plan System Reserves

**Water Reserve Fund**

Operating Reserve:	\$12,000 *
Emergency Reserve:	\$20,000 *
Equipment Replacement:	\$29,000
Loan Repayment Reserve:	\$16,800
New Construction:	<u>\$32,200</u>
	<b>\$110,000</b>





### WHY use Asset Management?

- Increasing Costs in the industry
- Increasing demands from regulators and customers
- Aging infrastructure & deferred maintenance
- Funding gap anticipated for cost of improvements and upgrades
- High cost of infrastructure improvements due to location and composition
- New Financial Reporting requirements





### WHY use Asset Management? Increasing Demands...

- From customers:
  - Heightened awareness of water & its make-up
  - Demand for more and better service(s)
  - Population growth and development
- From Regulators:
  - Regulations like Arsenic & Nitrate limits for water systems
  - Capacity Development requirements for SRF and other funding sources






### WHY use Asset Management? Aging Infrastructure...

**EPA's Gap Analysis**  
From 2012 – 2022, estimates show:

- Large systems est. need = **\$58.5 billion**
- Med. systems est. need = **\$41.4 billion**
- Small systems est. need = **\$37.2 billion**
- Total \$137.1 billion**



### The "GAP" (is not a clothing store)

NO Revenue Growth Average (in Billion's)		W/ 3% Revenue Growth Average (in Billion's)	
Drinking Water		Drinking Water	
CIP	\$102	CIP	\$45
O&M	\$161	O&M	\$ 0
<b>TOT</b>	<b>\$263</b>	<b>TOT</b>	<b>\$45</b>



### Benefits of Asset Management

- Reduced Operation and Maintenance Costs
- More efficient Resource Allocation
- Reduced risk of system failure and service down time
- More consistent service levels over time
- More effective communication
- More accurate financial planning
- Protection of reserve funds
- More efficient data management



### Balancing Maintenance Needs

- The cost of recurring, unplanned corrective maintenance is generally higher than the cost of Preventive/predictive maintenance.
- The cost of excessive planned maintenance can also be more costly than the value of the equipment warrants.
- Optimum balance of planned to unplanned maintenance is 70-80% planned to 20-30% unplanned, depending on the type of asset.



### We're already doing some Asset Management...

- Periodic inventory and evaluation
  - of system functional areas - treatment, distribution/collection, storage/impoundment, etc.
  - of equipment, fixtures and vehicles
- Maintenance Records
  - Pumps
  - Line replacements/repairs
  - Vehicles and equipment
  - Valves



### What else is needed for an Asset Management Program?

- **COMPLETE** system inventory & evaluation
- Goal Setting
  - Asset Condition levels desired
  - Service levels desired
  - Goals for accumulation of **RESERVES**
- Planning
  - Capital Improvements Programs
  - Maintenance Plans and Schedules
  - Replacement & Rehabilitation Planning
  - Risk Evaluation
- Data and System Integration



