



Seattle City Light's Asset Management Program

Northwest Hydro Operators Forum
September 25-26, 2012

Agenda

- Asset Management vs. WAMS – Definitions and Distinctions
- AM Program Budget Status
- AM Program Major Accomplishments
- WAMS Budget Status
- WAMS Project Status
- Going Forward

Impetus for Asset Management at SCL

- City Council approved SCL to implement Asset Management in 2005.
- Superintendent Carrasco identified purpose in 2005:
“to achieve greater cost effectiveness by lengthening the life and optimizing the operation of our physical assets. The program will allow us to lower the long-term costs borne by our customers.”
- The adopted Plan recommended a 5-year approach for implementing new asset management capabilities at City Light.

Summary of Life Asset Management Program (LAMP) (Navigant, 2008)

■ Original Assumptions/Basis

- Five-year implementation timeframe
- \$56 million in funding (\$24M in WAMS and \$32M in other asset-related activities)
- Inventory and condition of key assets was known/available

Original Asset Management Program Implementation Plan (2008)

Asset Records and Condition

- Centralized records with consistent processes and controls for updates, although not linked through integrated systems

Preventative Maintenance

- Combination of time-based and condition-based; based on stand-alone tools and industry data, rather than historical company trends

Design Standards

- Common design standards and practices but absent automated design and integrated work/maintenance management tools and systems

Data and Systems

- Data maintained in a variety of databases, but clearly “one version” of the truth; centralized approach to manage, purchasing and inventory channels, plus use of work management system(s)

Governance and Decision

- Decisions tools combine detailed analytics and subjective measures; governance coordinated across organizations

SCL Asset Management Model

Asset Management Program

Q: How to Maintain SCL Assets Better?

Asset Maintenance Management

**Inventory
Project**

**Condition
Assessment
Project**

Q: How to invest SCL budget Better?

Asset Investment Management

**Repair/
Condition
Improvement
Project**

**Replacement
Project**

**New Capacity
Growth**

Criticality Analysis/ Risk Analysis/ Best Practices/SCL Asset Maintenance Procedures

Strategic Asset Management Plans/Horizon Plans

Area	Key Assets
Power Supply	Turbines, generators, dams/spillways, auxiliary equipment, I&C, parks/environmental, substations and switchyards
Stations	Distribution substations and transmission switchyards, including all breakers/relays
Energy Delivery (Radial Systems)	Street lights, poles and related transformers, capacitors, switches, pole contacts (joint use)
	Transmission assets (poles, towers)
	Residential and C&I meters, including instrument transformers, special meters (i.e. interconnection), and primary meters
	Location of cable and wire in GIS (with some cable size data), and cable types deployed for most critical cable (top 20%)
Energy Delivery (Network)	<p>Transformers, network protectors, special protection systems, control units, primary cable with size/type, secondary cable without size/type, vaults, manholes</p> <p>Equipment locations (vaults, cable routing/locations, control units, service taps) and primary cable size in network GIS (without vault configuration, cable types, secondary cable size)</p>

Asset Management Program Budget Expenditure Status (in \$Million)

	2008	2009	2010	2011	2012	Total
Anticipated						
Total	3.3	3.3	3.3	3.3	3.3	16.5
Actual (a)						
Labor	0.3	0.8	0.6	1.1	0.4	3.2
Non-Labor	0.8	1.8	1.8	1.7	1.0	7.1
Total	1.1	2.6	2.4	2.8	1.4	10.3

(a) Major Expenditures: Pole Inventory Contract, Transmission Tower Inspection Contract, LIDAR Contract, Pole Test Contract, Pole Treatment Contract, AM Program Consulting Contract (CH2MHill)

Program Implementation Realities

Asset Records and Condition

- With few exceptions at the plants, the network and some equipment, asset records (inventory and condition) are not consistently kept and maintained.

Preventative Maintenance

- PM, when performed is inconsistent and not condition based, in part, because records are not maintained to enable condition-based decision making. Maintenance is reactive. Many assets are “run to failure”.

Design Standards

- Early stages of creating and implementing design standards; conservative planning criteria has led to under-utilization of assets. Lack of standards causes inefficiencies and inconsistencies throughout system.

Data and Systems

- Performance data is not available or accessible; many vendor and “homegrown” systems are individually maintained, and do not always share data with each other; some are not fully implemented.

Governance and Decision

- Quality of decision tools, and the governance and use appears very “judgment-based”, and varies among service areas.

SCL Distribution Assets (\$1,848 Million)

Key Asset Class	Asset Maintenance Management		Asset Investment Management	
	Inventory	Condition Assessment	Repair / Condition Improvement (O&M/ CIP)	Replacement (CIP)
Wood Pole	92,700 Wood Poles	~ 9,100 poles for replacement	Pole treatment to extend 10 – 20 yrs useful life (chemical and trusses) Contract underway	3,596 Poles Replaced Goals: 2,000 poles/ yr
Distribution Field Switches	Inventory underway	Scheduled to begin Fall 2012	Strategic Asset Management Plan being developed.	Currently no systematic program - replaced on an as-needed basis
URD UG Cable	~345 'Miles of 26kV	100 Miles inspected	Cable Injection ~70 Miles/year	84 Miles URD Cable replacement for 2013-2016

SCL Transmission & Substation Assets (\$164 Million)

Key Asset Class	Asset Maintenance Management		Asset Investment Management	
	Inventory	Condition Assessment	Repair / Condition Improvement (O&M/ CIP)	Replacement (CIP)
Substation Xfmer	54 Xfmers	19 Completed (2 rating "Poor" condition)	Repair/ Replace model (est. Jun 2013)	Programmatic Approach (est. Dec 2013)
Station Switches/ Circuit Breakers		Scheduled to begin Summer 2012		
Transmission Towers (CorTen Steel)	70 - 100 Poles	RFP for Condition Assessment being finalized.	Based on results of assessment	No replacement will likely be required
Transmission Towers (Steel Lattice)	About 1,200	Climbing inspection of about 80 towers in 2010 (no problems)	No planned activities – maybe some future painting	None needed.

SCL Production & Generation (\$703 Million)

Key Asset Class	Asset Maintenance Management		Asset Investment Management	
	Inventory	Condition Assessment	Repair / Condition Improvement (O&M/ CIP)	Replacement (CIP)
Generation Automation	Skagit Boundary Tolt Cedar Falls	System-wide capability assessment completed	Ongoing maintenance of legacy features	Boundary system implemented, Skagit implementation underway
Generators and Auxiliaries	23	Annual visual inspections, integrity testing, hydroAMP condition assessment	As-is systems inspected and maintained under PM program, replace as needed	Ongoing addition of on-line monitoring in conjunction with overhauls
Turbines & Auxiliaries	23	Annual inspection, hydroAMP condition assessment	PM-based on periodic visual and historic practice	Multi-year Investment based on business case

SCL Production & Generation (\$703 Million)

Key Asset Class	Asset Maintenance Management		Asset Investment Management	
	Inventory	Condition Assessment	Repair / Condition Improvement (O&M/ CIP)	Replacement (CIP)
Step-up Transformers	15	RBAM* Completed in 2001	PM-based on historic practice (time-based)	Multi-year Investment based on priorities
Dams and Appurtenant Structures	7	Annual operations inspection; 5-year safety inspection	PM-based repairs, recommendations from 5-yr. Inspection	Some auxiliary equipment replaced and/or refurbished for life extension

Design Standards and Compatible Units

- About 890 CUs in WAMs – Key Benefits
 - Standardize designs, materials, products and construction practices throughout SCL's system
 - Increase productivity, efficiency, work planning and scheduling
 - Reduce number of products and materials used by SCL
 - Facilitate training and succession planning, and improve flexibility of crews

Distribution – Next Steps

- Finalize Wood Pole SAMP and Distribution Switch SAMP
- Inventory and assess condition of substation switches and breakers
- Inventory and assess condition of URD and Network vaults
- Continue developing design and construction standards and compatible units
- Continue implementing wood pole test, treat & replacement

Power Production – Next Steps

- Move 28,000 assets from Maximo to WAMS
- Verify condition assessments on critical assets using hydroAMP
- Develop Corporate Management Reporting Metrics

Questions?

Lynn Mills
206-386-4481
lynn.mills@seattle.gov