



Asset Management Update

NW Hydro Operators Meeting

May 2008



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To Get Here – We Said...

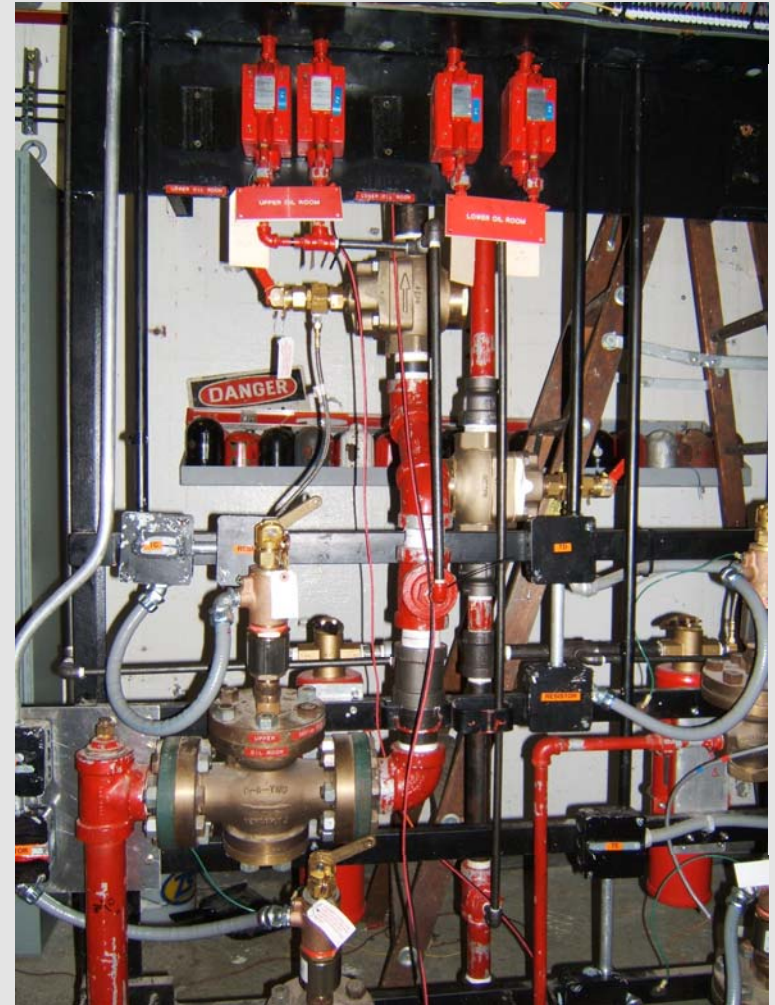
- ◆ **September 2006 – We're going to create a plan, implementation starts 1/2007**
- ◆ **May 2007 – We have a plan, implementation starts 7/2007**
- ◆ **May 2008 – We are underway! Real start (funding approved) 1/2008**



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Challenges to Getting Started

- ◆ IT component risk
- ◆ Desire to get benefits before work was done
- ◆ Budget authority and accountability



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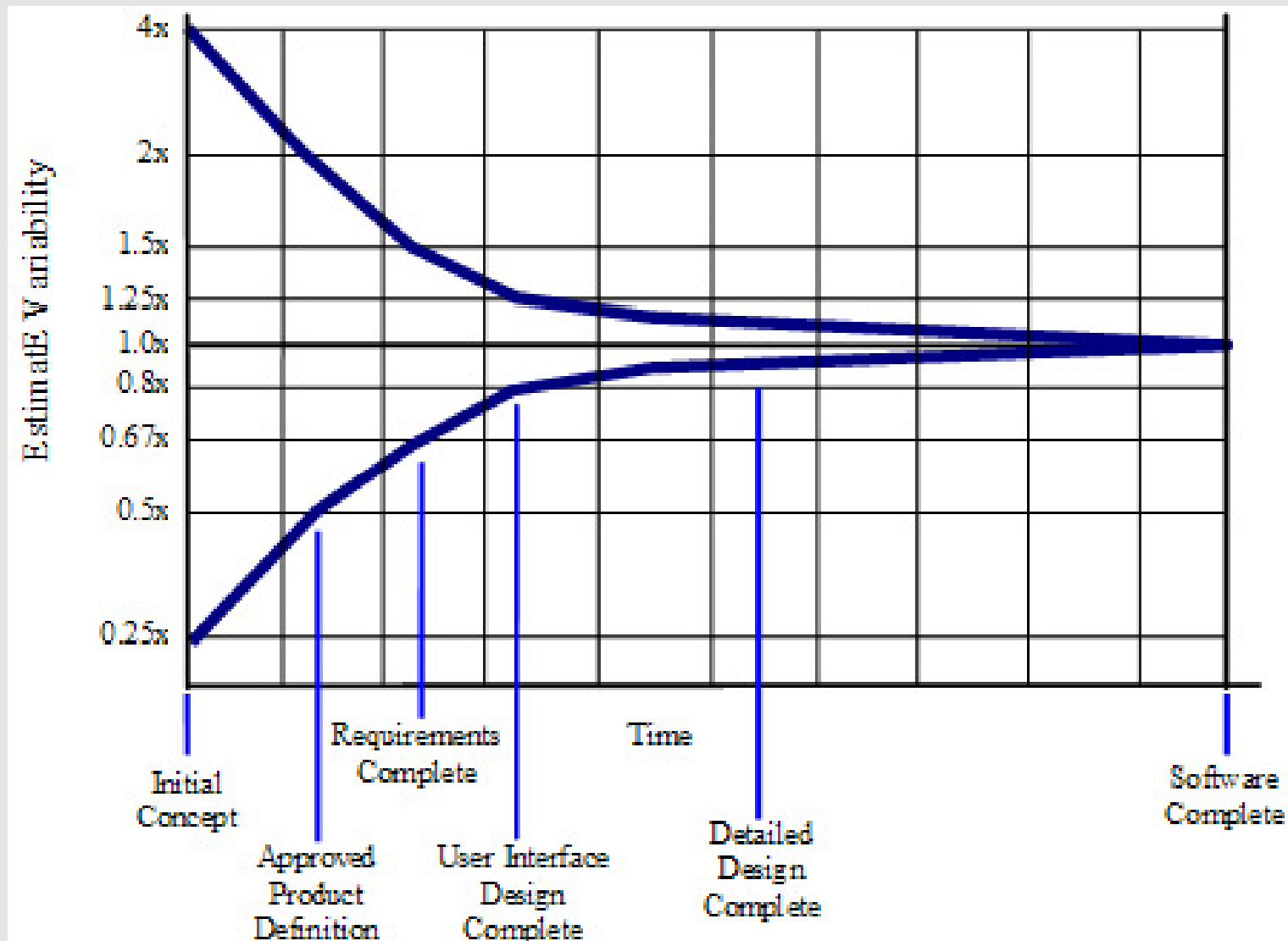
Biggest Risk

- ◆ **Work Management System implementation is largest cost item**
- ◆ **Roughly \$12 million based on bringing existing software across SCL**
- ◆ **IT strategy change, existing software assumption no longer accurate**



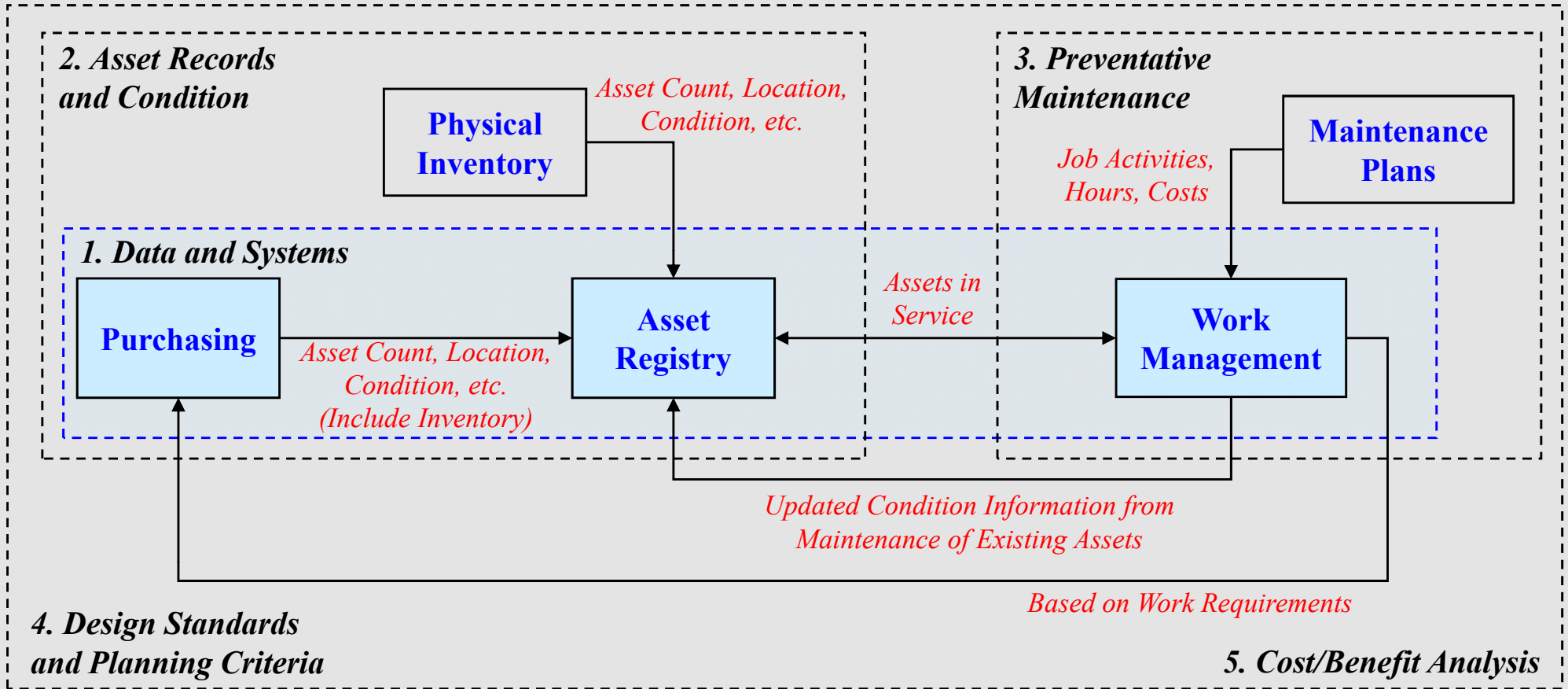
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Cone of Uncertainty



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Asset Management: Integrated Approach



- Single system of record for purchasing and inventory, integrated with Asset Registry

- Single Asset Registry for Energy Delivery
- Single Asset Registry for Power Supply and Stations (could be same as Energy Delivery)

- Work Management integrated with purchasing, inventory, and asset registry



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Enterprise Asset Management Strategy

Key Performance Indicators	■ KPIs established for major business units with measurable targets and expectations, although not necessarily tied (with analytical rigor) to specific project impacts
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 standalone tools and industry data, rather than historical company trends
Design Standards and Planning Criteria	■ 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)
Culture	■ Expectation of standardization and efficiency through repeatable work practices/processes; expectation that projects are supported by analytics
Organizational Skills & Capabilities	■ Centralized Asset Management capability (as skills are being developed); skills to support “Fully Functional” levels of job planning, standards, analytics, etc.; use of contractors for select activities
Cost/Benefits Analyses	■ Cost/benefit analyses heavily dependent on industry data, with “major” value drivers modeled
Governance and Decision Tools	■ Decisions tools combine detailed analytics and subjective measures; governance coordinated across organizations



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The Schedule and The Program

	2008			2009			2010			2011			2012		
Governance and Decision Tools															
E establish governance approach	█														
Update capitalization policy	█	█	█												
Develop/refine cost-benefit template	█	█	█				█	█	█						
Implement/refine decision support tool		█	█				█	█	█						
Implement/update budget control processes									█	█	█	█	█		
Data and Systems															
Hire Work Management Project Manager	█														
WMS - Refine and scope Work Management System	█	█	█												
WMS - Implement Purchasing and Inventory systems	█	█	█	█	█	█	█	█	█						
WMS - Implement Work Management System	█	█	█	█	█	█	█	█	█						
WMS - Implement compatible units system and module									█	█	█	█	█		
OMS - tie in with WMS - <i>separately scoped and funded</i>															
Asset Records and Condition															
Develop condition assessment process and prioritize critical assets	█	█	█	█	█	█	█	█							
Identify, survey and tag assets	█	█	█	█	█	█	█	█	█						
Perform condition assessments on 20% of most critical assets		█	█	█	█	█	█	█	█						
Document asset records/conditions (data entry)										█	█	█	█	█	
Perform ongoing inventory and assessments										█	█	█	█	█	
Preventative Maintenance and Operations															
Identify and document maintenance tasks for 20% most critical assets	█	█	█	█	█	█	█	█							
Complete job tasks and material lists for 20% most critical assets	█	█	█	█	█	█	█	█							
Establish work management processes and update maintenance schedules										█	█	█	█		
Perform ongoing maintenance planning										█	█	█	█	█	
Optimize major outage schedule (planned outages)										█	█	█	█		
Joint Use - review joint use and attachments, tracking and control systems										█	█	█	█		
Design Standards and Planning Criteria															
Hire Standards manager and staff															
Define/train on design and construction standards process															
Update property unit codes, labor, and material cost estimates															
Update design and construction standards, 20% most critical															
Conduct inventory review/optimization															
Institute design/construction audit function															
Conduct communications systems assessment															
Conduct feeder modeling systems assessment															
Revise design and planning loading criteria, document and implement															
Conduct reliability needs study using asset management data															

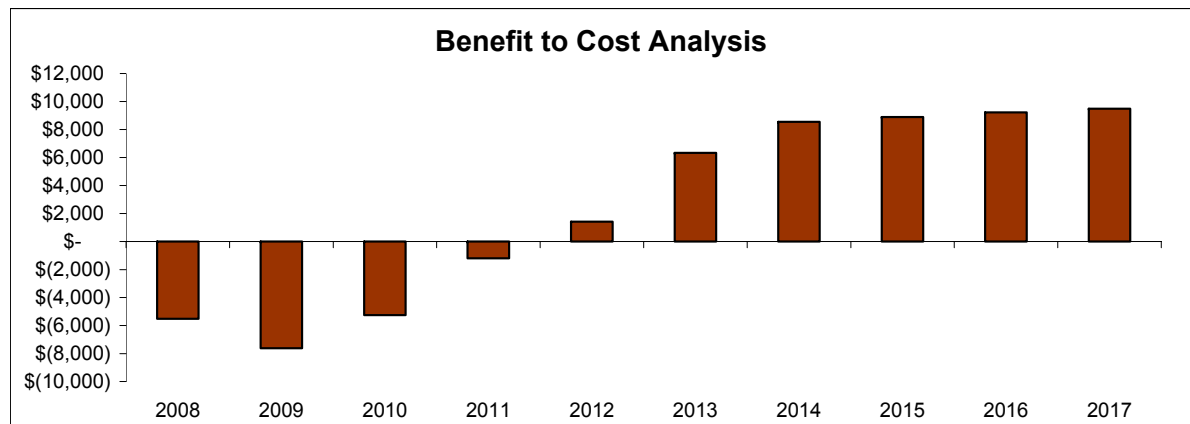


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The Asset Management Business Case

Category	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Costs										
KPIs	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Asset Records and Condition	\$ 1,479	\$ 2,427	\$ 1,465	\$ 486	\$ 486	\$ 486	\$ 486	\$ 486	\$ 486	\$ 486
Preventative Maintenance and	\$ 208	\$ 540	\$ 1,074	\$ 475	\$ 324	\$ 324	\$ 324	\$ 324	\$ 324	\$ 324
Design Standards and Planning Criteria	\$ -	\$ 8	\$ 1,201	\$ 2,423	\$ 1,830	\$ 770	\$ 770	\$ 770	\$ 770	\$ 770
Data and Systems	\$ 2,608	\$ 3,512	\$ 1,945	\$ 806	\$ 758	\$ 483	\$ 483	\$ 483	\$ 483	\$ 483
Culture	\$ 250	\$ 250	\$ 250	\$ 250	\$ 200	\$ -	\$ -	\$ -	\$ -	\$ -
Organization Skills and Capabilities	\$ 459	\$ 617	\$ 672	\$ 468	\$ 468	\$ 278	\$ 278	\$ 278	\$ 278	\$ 278
Governance and Decision Tools	\$ 162	\$ 324	\$ 324	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Program Management	\$ 350	\$ 350	\$ 350	\$ 350	\$ 350	\$ -	\$ -	\$ -	\$ -	\$ -
	\$ 5,516	\$ 8,028	\$ 7,282	\$ 5,259	\$ 4,416	\$ 2,340	\$ 2,340	\$ 2,340	\$ 2,340	\$ 2,340
Benefits										
Capital Cost Reductions	\$ -	\$ 171	\$ 1,385	\$ 2,690	\$ 3,770	\$ 5,860	\$ 7,387	\$ 7,575	\$ 7,766	\$ 7,860
Preventative Maintenance & Operations	\$ -	\$ 240	\$ 520	\$ 1,086	\$ 1,420	\$ 1,867	\$ 2,209	\$ 2,223	\$ 2,237	\$ 2,251
Inventory Reductions (Carrying Costs)	\$ -	\$ 1	\$ 7	\$ 28	\$ 72	\$ 73	\$ 74	\$ 75	\$ 75	\$ 76
Reliability	\$ -	\$ -	\$ 109	\$ 256	\$ 572	\$ 867	\$ 1,217	\$ 1,352	\$ 1,491	\$ 1,633
	\$ -	\$ 412	\$ 2,020	\$ 4,061	\$ 5,834	\$ 8,667	\$ 10,887	\$ 11,226	\$ 11,570	\$ 11,819
Net Savings (Costs)	\$ (5,516)	\$ (7,616)	\$ (5,261)	\$ (1,198)	\$ 1,418	\$ 6,327	\$ 8,547	\$ 8,885	\$ 9,230	\$ 9,479

NPV (3%)	\$16,199
NPV (7%)	\$8,544
NPV (10%)	\$4,472
IRR	15%
Benefit to Cost Ratio (3%)	1.43



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Business Case: Costs

External Capital Costs	<ul style="list-style-type: none">■ Capitalized costs for software and associated system implementation (including training)
External O&M Costs	<ul style="list-style-type: none">■ Consultant/contractor costs for business process improvement projects, asset surveys, data cleanup, and program management
Internal One-time Labor Costs	<ul style="list-style-type: none">■ Incremental (i.e., above and beyond what is currently expected to be incurred) capital and O&M costs <u>for a temporary period of time</u> during the “Fully Functional” Asset Management implementation■ Costs incurred either through overtime or through early (i.e., temporarily redundant) hiring to replace planned retirements
Internal Ongoing Labor Costs	<ul style="list-style-type: none">■ Incremental (i.e., above and beyond what is currently expected to be incurred) capital & O&M costs on an <u>ongoing</u> basis to support new business activities required for “Fully Functional” Asset Management■ Costs incurred through additional hires above and beyond what is currently planned



Business Case: Benefits

Capital Costs	<ul style="list-style-type: none">■ Apply revised planning criteria for growth-related additions■ Institute Compatible Units and revised design standards■ Employ contractors for lower skill, recurring work and peak load offsets■ Implement work management systems to improve work scheduling and material usage■ Implement risk-based CIP prioritization models, methods and decision tools
Preventative Maintenance and Operations	<ul style="list-style-type: none">■ Reduce PM-related labor & materials expense using condition-based methods■ Reduce replacement power costs via improved outage management■ Employ contractors for lower skill, recurring work and peak load offsets■ Increase revenue from pole attachments, fewer metering inaccuracies■ Implement risk-based CIP prioritization models, methods and decision tools
Inventory Carrying Costs	<ul style="list-style-type: none">■ Reduce Power Supply inventory – plant, site and stores■ Reduce Stations inventory – plant, site and stores■ Reduce Energy Delivery inventory – stores and field
Reliability “Costs”	<ul style="list-style-type: none">■ Reduce reliability-based (SAIFI) and duration-based (SAIDI) interruptions from equipment failures/outages■ Reduce power plant equipment failures via improve condition monitoring■ Implement risk-based prioritization models to reduce reliability-based budget



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City Light Asset Management Challenges



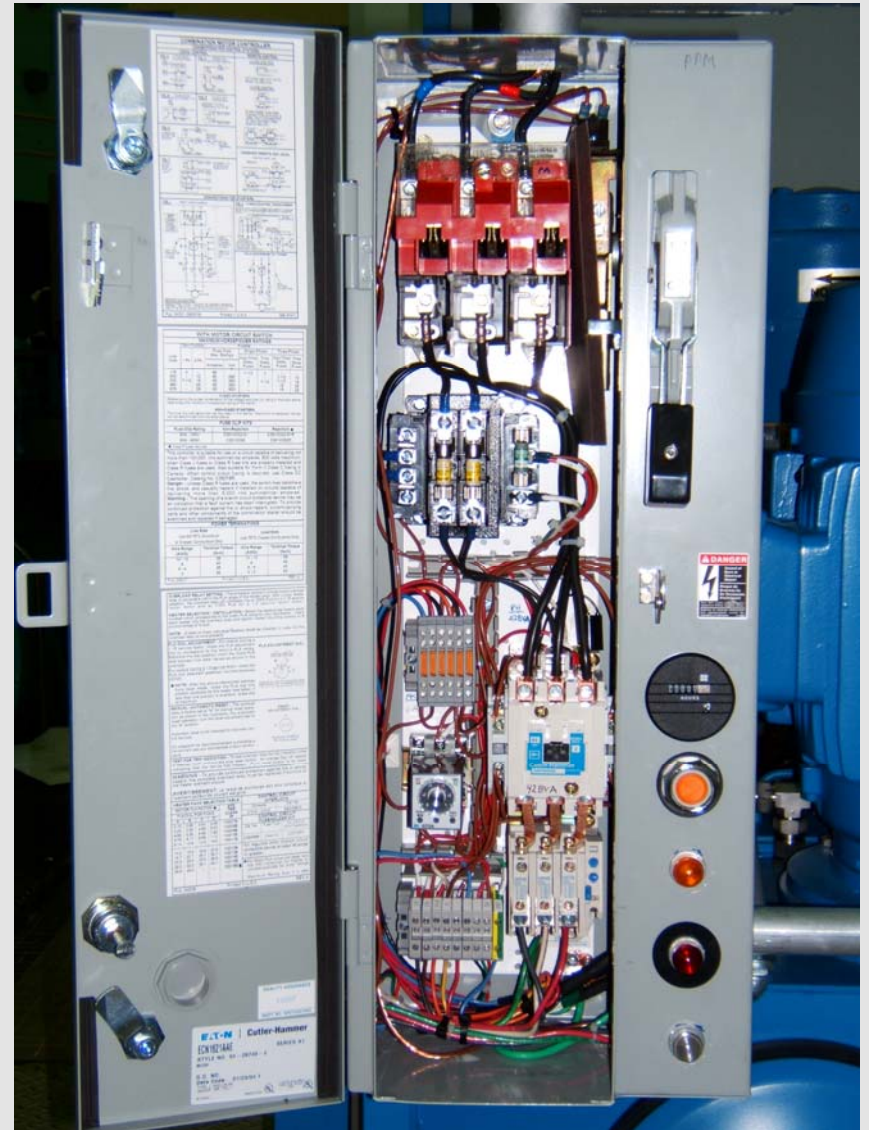
- ◆ **An aggressive program, even with a 5 year implementation window**
- ◆ **IT ... significant scoping and implementation effort**
- ◆ **Standardizing business processes**
- ◆ **Enterprise-wide change management ... *expecting* rigorous cost/benefit analyses, clear project prioritization, and use of design/construction standards**



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Next Steps

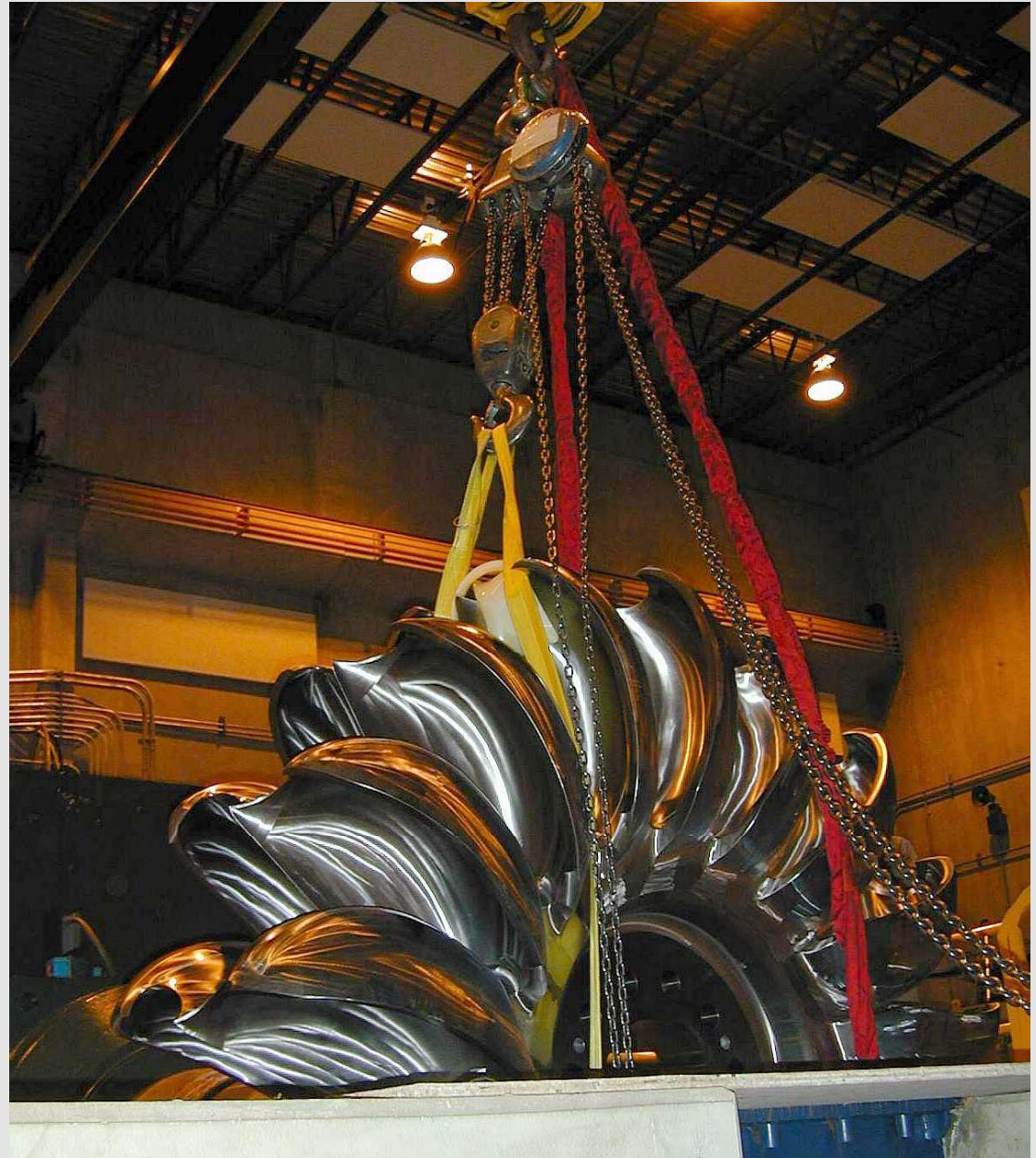
- ◆ Train staff
- ◆ Refine work management system scope, schedule, budget
- ◆ Implement per program plan
- ◆ Track costs and benefits
- ◆ Long term – culture change to AM Philosophy



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Questions?

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