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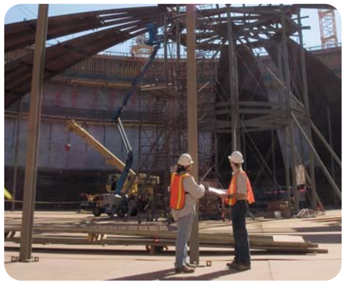



Optimizing Capital and O&M Decisions During a Rate Sensitive Time

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Agenda

- Why Capital Optimization?
- Process Overview
- Value of Optimization

How Do You Optimize Expenditures?

Common Planning Shortcomings

- Lack of full identification of all substantive issues surrounding capital projects
- Lack of tools to perform needed analyses:
  - Quickly test scenarios
  - Optimize total spend portfolio
  - Effectively analyze capital project <u>impact on reliability and risk</u>
- Lack of integration of related and interdependent issues

Black & Veatch's process addresses these shortcomings.

Balancing Tradeoffs

- Our optimization process and model assists utilities with managing the important balance of the following capital improvement program tradeoffs:
  - **Budget constraints**
  - **Risk**: Reliability and Outages
  - **Demand Growth**, Market Risk and Upside Potential

It is crucial to balance tradeoffs between budget and project drivers.

Key Targets of Optimization Process

- Defendable process and results
- As much objectivity in prioritization as possible
- Optimal timing of projects
- Ability to return to process/model in future and update
- Ability to rearrange prioritization of projects based on changes in anticipated costs, benefits, assumptions, etc.

Overall Optimization Process Overview

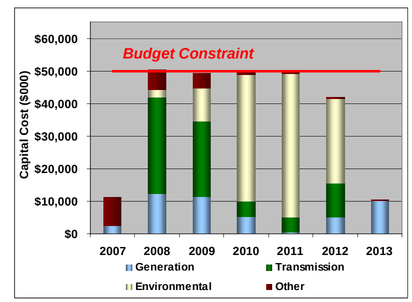
Facilities Assessment
- Failure Modes and Effects Analysis
- Inspection Planning/ Condition Assessment
- System Supply/ Demand Assessment

Project Development
- Identify Capital and O&M Projects
- Prepare Project Descriptions
- Develop Capital, O&M, and Failure Costs

Prioritization
- Assumptions Form
- Risk Mitigation / Simulation Ranking
- Weighted Matrix Scoring

Prioritization Rankings by System or Overall

Implementation Schedules



Key Results of Process

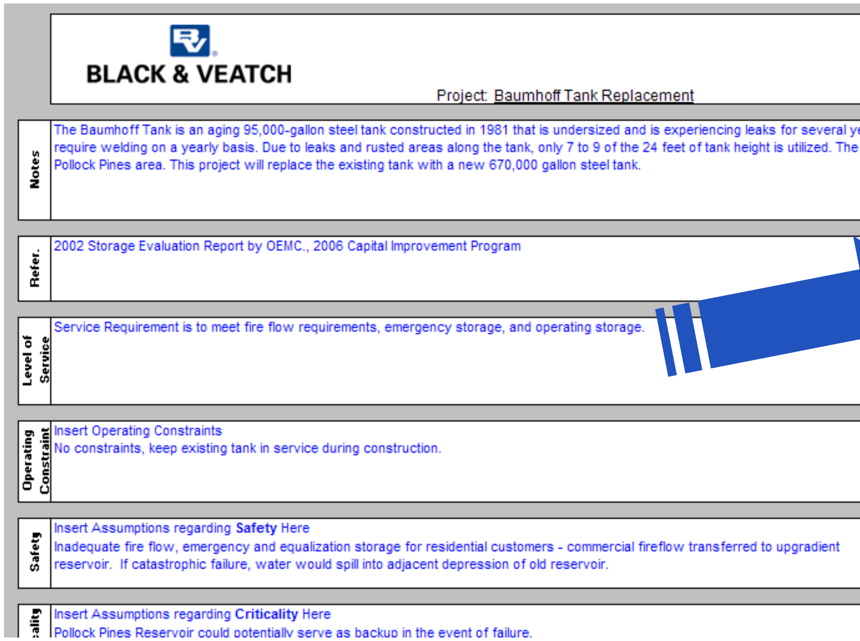
- Facilities Assessed
- Results Documented

- Project Identification
- Develop Cost Assumptions

- Prioritization Process
- Criteria Ratings
- Prioritization Results

- Timing Optimization
- Implementation Schedule

Capital Optimization Simulations:
Assumptions Form and Financial Template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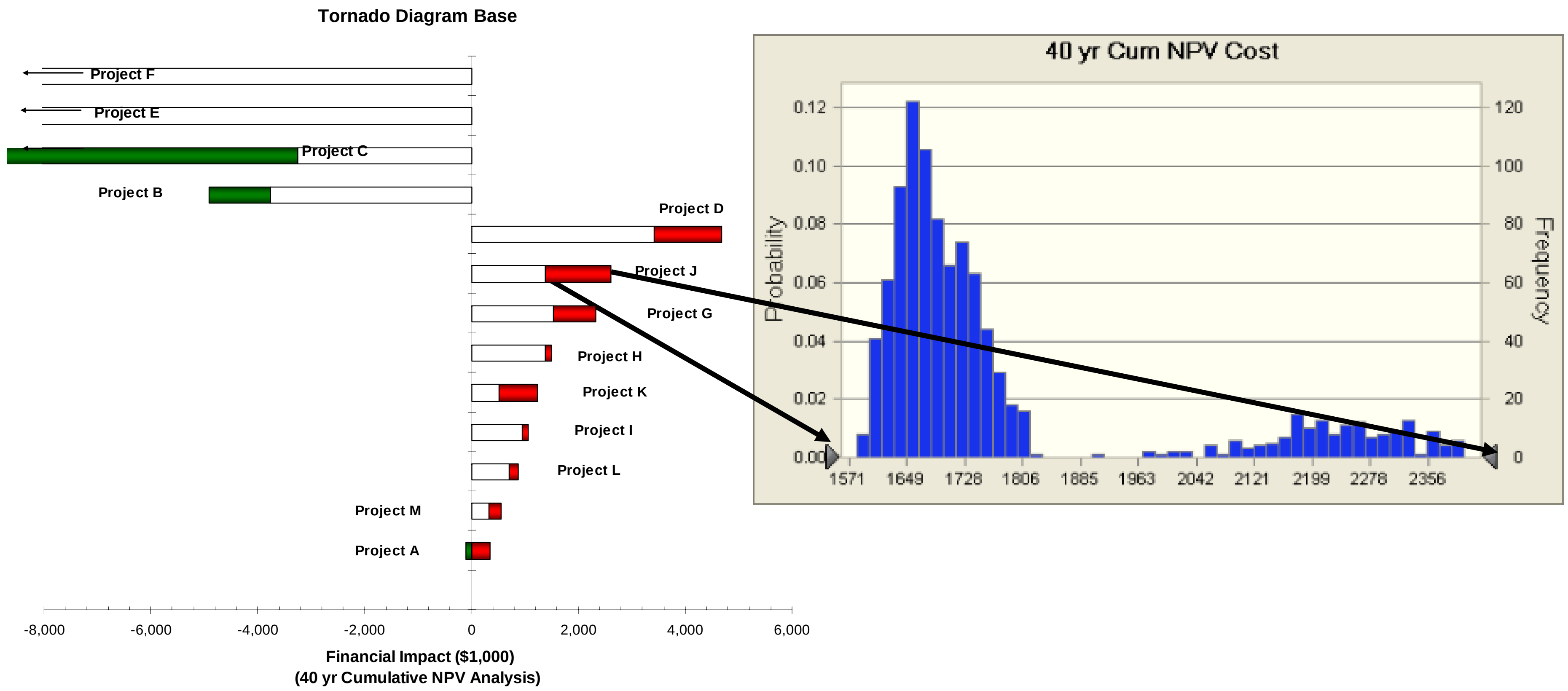
Project: Baumhoff Tank Replacement

Notes	The Baumhoff Tank is an aging 95,000-gallon steel tank constructed in 1981 that is undersized and is experiencing leaks for several ye require welding on a yearly basis. Due to leaks and rusted areas along the tank, only 7 to 9 of the 24 feet of tank height is utilized. The Pollock Pines area. This project will replace the existing tank with a new 670,000 gallon steel tank.
Refer.	2002 Storage Evaluation Report by OEMC., 2006 Capital Improvement Program
Level of Service	Service Requirement is to meet fire flow requirements, emergency storage, and operating storage.
Operating Constraint	Insert Operating Constraints No constraints, keep existing tank in service during construction.
Safety	Insert Assumptions regarding **Safety** Here Inadequate fire flow, emergency and equalization storage for residential customers - commercial fireflow transferred to upgradient reservoir. If catastrophic failure, water would spill into adjacent depression of old reservoir.
ality	Insert Assumptions regarding **Criticality** Here Pollock Pines Reservoir could potentially serve as backup in the event of failure.

- **Primary Output**
  - Calculation of financial efficiency
  - Total score based on cost and risk factors

- **Input parameters**
  - Capital costs
  - Probable year of installation
  - O&M pre- and post-construction
  - End of useful life
  - Probability of failure
  - Cost of non-replacement
  - Revenue generated
  - Regulatory risk
  - Criticality risk
  - Safety risk

Capital Optimization Simulations:
Probability Distributions and Tornado Diagram



Financial Analysis Consistently Evaluates Projects Based on Project NPV

- Reliability and savings projects are evaluated with a consistent approach and the same financial template
- Avoided costs and 'real' savings are identified when calculating expected NPV outcome

Sort by Bus Unit

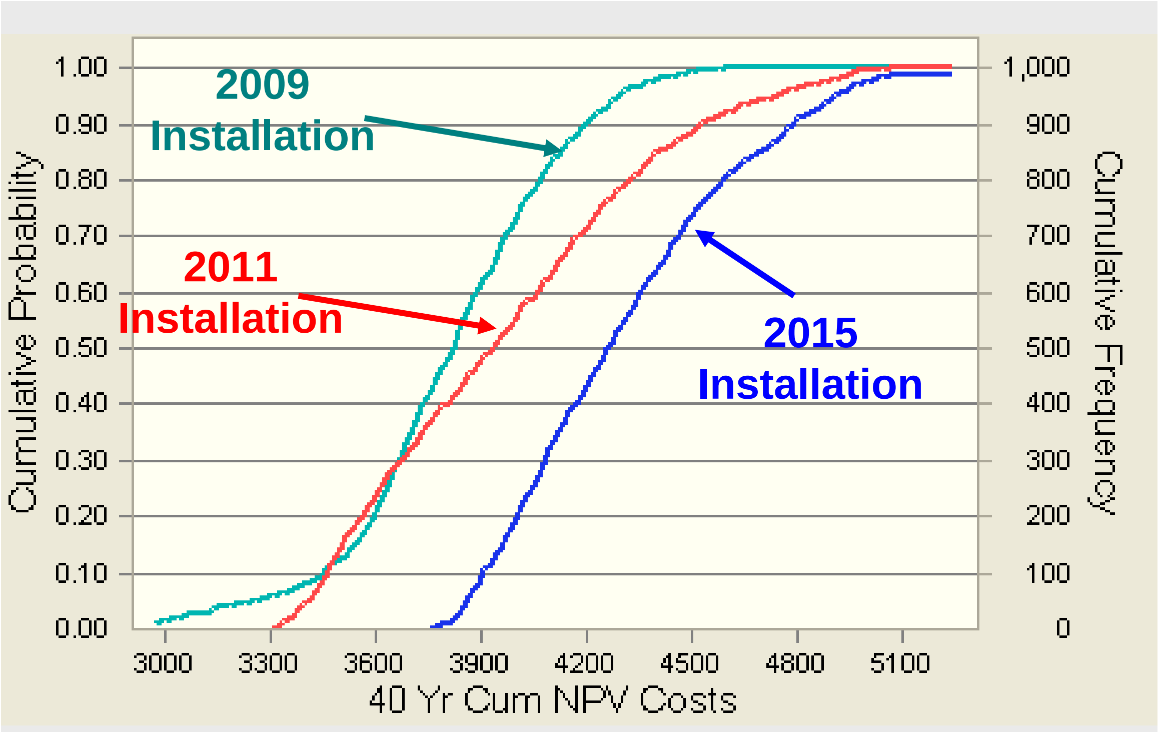
Prioritize By Expected Outcome

Description	Business Unit	Expected Outcome	Capital Cost
SCR Upgrades	Power	-72,424	5,789
Chiller	Other	-22,549	1,127
Turbine Upgrades	Power	-19,432	12,134
AMI	Other	-2,966	4,658
Ozone Generator - Plant Failure	Water	-134	2,265
Distribution R&R	Water	1,170	1,140
230 kV Breaker Replacements	T&D	1,210	1,354
Substation Rebuild	T&D	1,830	212
Ozone Generator - Unit Failure	Water	2,339	2,276
Aux Xfmr Upgrades	Power	5,206	4,889
Substation Rehab	T&D	7,272	7,520
IT System Upgrades	Other	8,669	27,593
Superheater Tubes	Power	9,355	9,434
Water Reuse Project	Water	24,287	60,182
230 kV T-Line	T&D	26,817	34,346

Optimize Project Timing to Minimize Risk

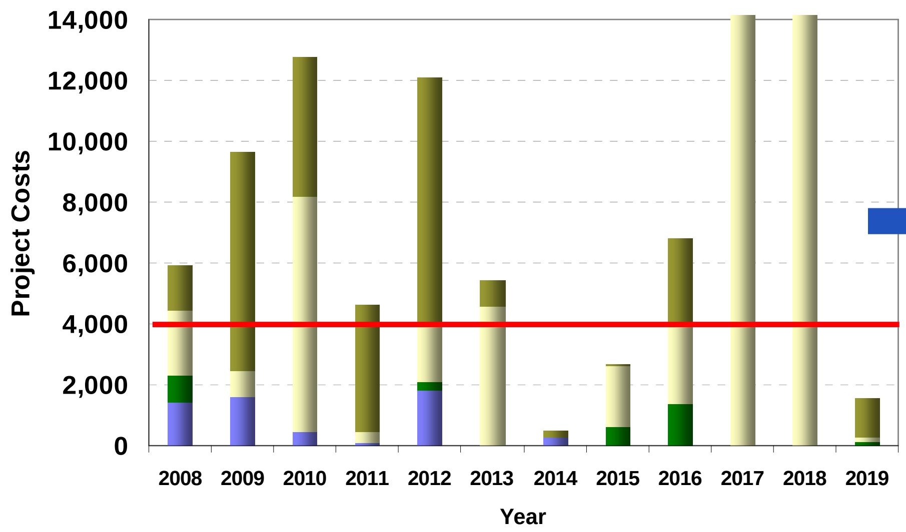
Optimization Process tests range of installation years to develop 'optimal' year assuming a certain level of utility risk tolerance.

Comparison of Project Timing

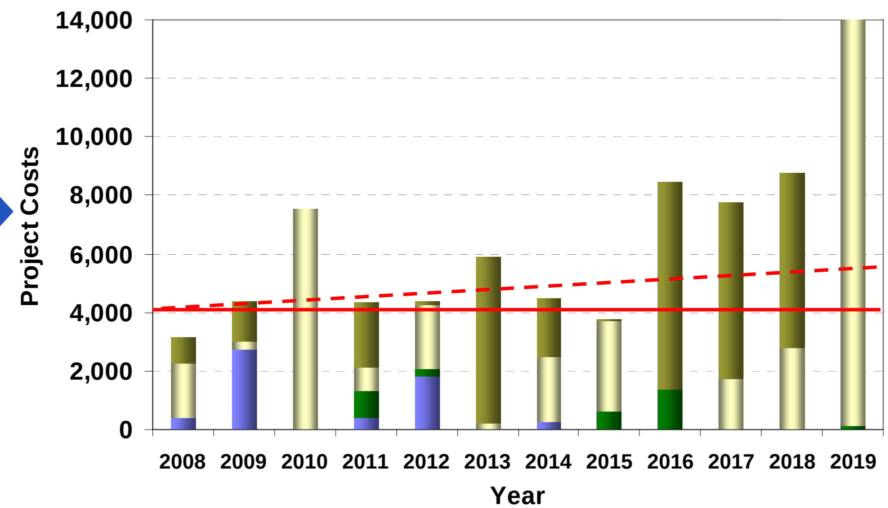


Projects Scheduled to Include Budget Considerations

Annual Capital Costs – NO BUDGET
Installation years determined through Optimization Process



Annual Capital Costs – WITH BUDGET
Lower ranking projects moved back in schedule to meet budget constraints



Optimization Helps Balance Tradeoffs

- In summary, our optimization process and model assists utilities with managing the important balance of the following capital improvement program tradeoffs:
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Value of Optimization Process

Strategic Value

- *Objectively* schedules projects to meet Risk Tolerance levels and Budget Constraints
- *Defendable* Approach
  - Adds to defensibility of projects by visualizing and quantifying the potential financial risks of project delays
  - Condition of Asset incorporated throughout Prioritization Process
- Leads to greater *understanding* and quantification of project and system risks

Functional Value

- Provides full *documentation* of all project assumptions
- Allows for quick *sensitivity analysis*
- Allows for impact analysis of *new budget* constraints
- Facilitates *integration* of new projects added to CIP in subsequent years
- *Re-prioritization* of CIP can be done more quickly when assumptions change

Other Values of Optimization Process

- Enables effective communication and buy-in within and between utility departments
  - Engineering
  - Operations
  - Finance
  - Risk Management
  - Capital Budgeting Group

- Enables enhanced communication with governing bodies/public
- Evaluates wide variety of projects with a consistent and documented approach
- Can be used to evaluate other utility projects (e.g., water, reclaimed water, wastewater, electric, gas)

Impacts of CIP Optimization on Rates

- Rate increase stabilization
  - Delay large, rate-impacting projects until risk tolerance levels are exceeded
- Lower revenue bond interest rates
  - *"A community desiring an optimum debt rating should be able to demonstrate an effective planning program for capital improvements."*

– Standard and Poor's

Thank You for Listening

Any Questions?

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