Engineering, Operations, & Technology Committee

Risk Management in Capital Project Planning and Delivery

Item 6c

November 18, 2024

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Risk Management in Capital Project Planning and Delivery

Subject

Risk Management in Capital Project Planning and Delivery

Purpose

Provide an update on Metropolitan's approach to managing risk associated with capital projects

Next Steps

Continue enhancing Metropolitan's risk management approach

Risk Management

Overview

- Projects initiated largely to reduce operational risks
- Metropolitan Engineering manages risk throughout the project delivery cycle through:
  - Rigorous planning & design
  - Continuous reviews
  - Construction management

Risk Management – Facility Planning

Rigorous Facility Studies/Evaluations

- Infrastructure Resilience
  - Drought
  - Earthquake
  - Wildfire
  - Flood
  - Climate change
- Infrastructure Reliability
  - Condition assessment
  - System vulnerability assessment
  - System flexibility assessment
- CAMP4W

Capital Project Risk Management – Design Phase

Metropolitan
Standard Detail Book

Risk Management Tools & Processes

- Value Engineering – Project analysis routinely includes development of a risk register
- Constructability Review – Team process for evaluating construction docs for potential risks
  - Review of risk register
- Design Standards may exceed national standards based on lessons learned & risk avoidance/mitigation

Capital Project Risk Management – Design Phase (continued)

Coatings Testing

Risk-Based Design

- Metropolitan's design criteria meet or exceed common standards
  - Seismic – water treatment/delivery facilities designed as 'essential facilities' with a 2,500-year return period with site-specific geotechnical analyses
  - Valve design – material & testing requirements exceed AWWA & ASME
  - Coatings – products go on the approved coatings list after in-house lab testing demonstrates performance

Risk Management – Construction Phase

Construction Risks

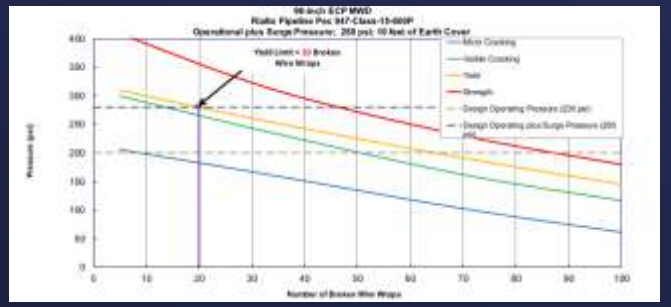
- Safety
- Differing site conditions
- Coordination with operations
- Equipment delivery
- Shutdown/outage planning
- Managing public relations

Perris Valley Pipeline Construction

Short-term Programmatic Risk Management

Risk Management Example
PCCP Rehab. Program

- Comprehensive monitoring & inspection program includes:
  - Visual & electromagnetic inspections
  - Monitoring & addressing local stray currents
  - Identify distressed segments (‘wire breaks’ + risk curves)
- New data - elevated risk caused reprioritization of repair of the Allen-McColloch Pipeline



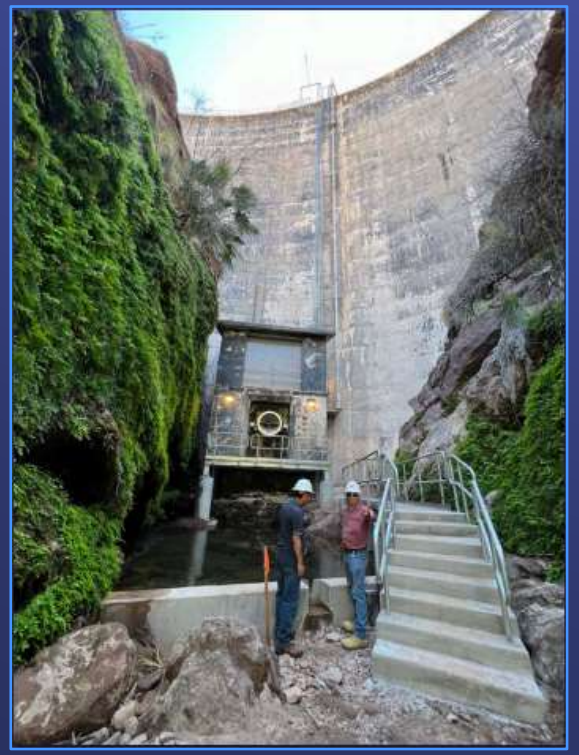
Risk Curves

Electromagnetic Inspection

Risk Management Example
Gene Wash Valve Replacement

Construction-related Risks

- Discharge isolation device leaked & oddly configured
- Work in steep canyon with complex geology
- Unknown facility condition
- Protect facilities & allow access
- Environmental protection
- Risk-related activities
  - Value Engineering Workshop
  - Constructability Review
  - Post Construction Valve Testing Risk Workshop



Gene Wash
Dam Discharge Facility

Risk Management Example
Gene Wash Valve Replacement

Risk Register

Risks Considered & Mitigated

VE Workshop

- Rock fall from nearby slopes; address controls; safety improvements; access improvements

CR Workshop

- Revisited register
- More geologic data needed; slide gate condition may be worse than expected; isolation device installation; leakage management; equipment & access issues

Valve Test Workshop

- Mechanical/electrical failure of both the new fixed cone valve & the refurbished slide gate; reservoir debris lodged in the new discharge line; dam structural damage

Result: Successful construction & testing

Risk Management – Capital Project Delivery

Gene Wash Valve Test

Summary

- CIP project delivery is a continuous process of managing risk
- R&R projects managed through CIP prioritization & project execution
- Large future programs will be evaluated through Board-driven CAMP4W process


THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA
1928