State Water Project Asset Management

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November 14, 2018
Drivers for Asset Management

- O&M manages a lot of programs and assets
  - Not only the operator and maintainer
  - Also Program Management organization

- Aging infrastructure
  - Public Safety
  - Reliability
  - Increasing expenditures

- Complexity of operating the SWP today

- Longer-term investment and resource plans
  - Balancing O&M and capital expenditures

- Integrated approach to managing SWP infrastructure
  - Dams, plants, conveyance, and other civil assets

Key Elements of Asset Management

- Common framework for business lines
  - (Line of Sight)
  - Organizational objectives
  - Understanding stakeholder needs
  - Defining levels of service
  - Policies, strategies, & plans
  - Roles & Responsibilities

- Monitoring condition & performance

- Identifying, assessing, & managing risks

- Lifecycle approach to managing assets

- Establishing long-term financial plans
  - Resources, expenditures, and funding
  - Optimizing capital & O&M expenditures

- Enabling continuous improvement
What is Asset Management?

Coordinated activities of an organization to realize value from its assets

- Asset management is about
  - collaborating across disciplines to…
  - make the best decisions…
  - using all the information and insights available.

- Asset management philosophy
  - asset-centric view in organizing activities
    - Understanding the assets' needs and value/service they provide
  - everybody understanding their roles playing their part
  - continuous improvement

- ISO 55001 provides a framework for integrated decision making
ISO 55001 – Asset Management System

- Ch. 4 & 5 – Context and Leadership
  - Why does the organization exist?
  - What services are the assets intended to provide?
  - Who are those services provided to?
  - What are our stakeholders' expectations?
  - Instructions to align and guide the organization

- Ch. 6 & 7 – Planning and Support
  - Develop plans to provide those services
  - What are our goals, objectives, and performance measures?
  - How is risk used in the decision making processes?
  - Develop/acquire resources to execute the plans

- Ch. 8 – Operation
  - Do the work in accordance with the plans
  - Document work

- Ch. 9 & 10 – Performance Evaluation and Improvement
  - Monitor, adjust, and continually improve

ISO 55001 Standard
- Over 180 specific requirements
Lifecycle includes the same 4 elements

- Repair/Refurbish/Replace strategies
  - Renewal is not simply replacement in-kind
  - Reconsider the original design requirements and future demands

- Reinvestment
  - Treat as though we are building something new
  - Decisions shall consider whole lifecycle costs of the asset

- Asset Management provides framework for lifecycle management
Risk as a Common Currency

Risk = Likelihood \times Consequence

Risk Assessment

- Canal Pool X
- Canal Pool Y
- Power Plant 1
- Pumping Plant 2
- Dam Z

Risk-Informed Strategies

- High Risk Zone
  - Strategy: Plan for asset renewal and/or risk mitigation
- Medium Risk Zone
  - Strategy: Mix of reactive and proactive
  - Strategy: Reactive Strategies Operate to failure
- Low Risk Zone
  - Strategy: Proactive condition and/or performance monitoring

Consequence of Failure

Likelihood of Failure

High

Low
Strategic Risk Management

- **O&M Risk Framework**
  - Risk policy
  - Risk management principles
  - Governance
    - Roles and responsibilities
  - Risk criteria and methodology
  - Risk processes

- **Framework Details**
  - Based on ISO 31000
  - Processes for risk identification, assessment, and treatment
    - Asset | Facility | Portfolio | Enterprise
  - Processes to communicate risks internally and externally
  - Builds upon O&M’s existing risk management programs
Risk Matrix

- **Semi-Quantitative Approach**
  - 7x7 matrix
  - Log-log scale

- **Consequence criteria based on SWP Strategic Plan**
  - Public Safety
  - Personnel Safety
  - Compliance
  - Water Delivery
  - Other SWP Purposes
  - Reputation
  - Financial Impact
Risk-Informed Planning

- How has risk criteria been used so far?
  - Review of CY 2018-2019 budget
  - CY 2019-2021 budget planning
  - SWP Financial Management Enhancements Program

- Planning tools incorporate 3 key project inputs
  - Cost
  - Risk
  - Resources (labor)

- Current outputs
  - Resource-loaded, risk-informed 2-year budget
  - Risk-informed 5-year capital plan

- Next Steps
  - Portfolio-level and enterprise risk registers
  - Initial 20-year asset investment forecast
  - Continual Improvement