Improving Investment & Management of the State Water Project through Asset Management

Challenge of Managing Large, Interconnected and Aging Water Resources System

Managed by the California Department of Water Resources (DWR), the California State Water Project (SWP) is a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants extending more than 700 miles. The SWP drives the economic engine of California, supplying water to more than 27 million people and irrigation for 750,000 acres of farmland. This ambitious project, built mostly in the 1960s, is aging. To retain the benefits of water delivery, flood risk management, recreation, and reduce risks to public safety, DWR must have an equally ambitious and strategic approach to maintain, repair, and refurbish its components.

Risk-Informed Asset Management: A Framework for Effective Investment

DWR has developed and begun to roll out a strategic approach for investing in maintenance, refurbishment, and improvements across the entire State Water Project infrastructure portfolio. Called Asset Management, it is a holistic process that assesses condition and risk of State Water Project infrastructure and uses that information to develop priorities for managing, sustaining, restoring, and modernizing State Water Project facilities. DWR uses the asset management framework to make decisions that reflect the most effective balance of performance, cost, and risk management.

The value of such an approach is that it allows DWR to:

- Characterize, articulate, and compare risks across the State Water Project, geographically and by infrastructure type (e.g., dams, pipelines, aqueducts, power plants);
- Make an evidence-based case for current and anticipated management and capital investments;
- Prioritize funding highest-risk projects, thereby maximizing overall risk reduction and upholding public safety; and,
- Develop transparent management and investment plans.

The activities DWR is putting in place to support this system include:

- Standardized methodologies for determining asset risk, including assessing condition and the potential consequences of poor performance (e.g., loss of life, property damage, loss of water supply or energy production, loss of recreation, and/or environmental damage).
- Use of a risk matrix that allows for comparison of projects to support decision-making, including prioritization of activities such as operations, maintenance, capital investment, emergency preparedness, and public awareness.
- Comparing the likelihood and consequences of potential project failures in order to make risk-informed investment decisions.
- Implement transparent decision-making processes.

How Does SWP's Asset Management Approach Work?

Each year, DWR updates its 2-year budget and 5-year capital plan. This allows DWR to budget for implementing projects in the near-term while also providing the opportunity to continually adjust longer-term planning as needed. DWR conducts condition inspections and has begun to conduct a variety of risk assessments (this includes condition and natural hazards but adds information about

potential consequences and estimated likelihood of failure or malfunction). Information from these assessments are all mapped along a common set of criteria which allows them to be compared to each other.

The likelihood of failure is estimated by project experts based on the existing condition of the infrastructure and potential scenarios that could lead to failure. Consequences are estimated based on the potential impacts that would occur following a failure. DWR considers a variety of consequence criteria in the State Water Project risk assessment process, including:

- Public Safety – potential loss of life or injury to people and property.
- Personnel Safety – impacts to the safety of those who work on the State Water Project.
- Water Delivery – impacts to the ability to reliably deliver water to State Water Project customers.
- Other State Water Project Purposes – impacts to fulfilling other State Water Project functions, such as power generation, flood risk management, environmental protections, and recreation opportunities.
- Financial Impacts – including recovery and repair costs, as well as longer term investment costs.

DWR learns and adapts through risk assessments and updates both its financial and asset management plans accordingly. Resource constraints require a phased approach to conducting risk assessments; therefore part of the asset management cycle is to continually use new information on condition and risks to update future plans.

What's Next?

The asset management approach will take several years to rollout across the entire State Water Project. DWR will conduct detailed condition and risk assessments on all major facilities in the State Water Project portfolio. DWR also anticipates that the benefits will accrue over time, resulting in an improved long-term understanding of financial needs related to aging infrastructure, and a comprehensive approach to maintain benefits while reducing risks.