Independent Review of SFPUC’s Water System Improvement Program

Prepared for San Francisco Public Utilities Commission

Independent Review Panel:

Russell J. Stepp, P.E. (Panel Chair)
John W. Kluesener, Ph.D.
James G. Mueller, P.E.
Douglas A. Selby, P.E., Ph.D.
John E. Somerville, P.E.

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Summary

The San Francisco Public Utilities Commission (SFPUC) hired a five-member independent panel to review its $4.6 billion, multiyear Water System Improvement Program (WSIP) and answer six key questions

1. Is the WSIP organization adequate to deliver the program?
2. Are the systems, procedures, and business processes used to deliver the WSIP adequate?
3. Are the status and delivery performance of the WSIP being reported adequately and accurately?
4. Is the progress made to date on the WSIP reasonable?
5. What are the greatest challenges and risks that could impact program delivery?
6. What steps or actions does the panel recommend the Commission and/or upper management take to promote accountability, minimize risks, and guarantee success?

Conclusions

The panel’s overall conclusions regarding the first four questions are as follows. This is followed by lists of the main risks and the panel’s recommendations. These are discussed further in the panel’s report to the Commission.

1. **WSIP Organization:** The WSIP Team appears to have an adequate framework to deliver the program. The WSIP Team has developed standardized procedures for its Construction Management (CM) Program; has delegated decision-making responsibility across the program, regional, and project levels; and has employed state-of-the-art tools for managing projects and staff.

2. **Systems, Procedures, and Business Processes:** The WSIP systems, procedures, and business processes seem adequate but are now in early implementation; they should be monitored and adjusted as construction activities ramp up. In addition to tools, face-to-face interaction will remain important throughout the regions and WSIP organization.

3. **Reporting of Status and Delivery Performance:** WSIP Management prepares and reviews various monthly reports that provide cost and schedule updates and highlight critical items. In the panel’s view, the Quarterly Reports to the Commission are too lengthy and general and do not clearly convey progress and challenges.

4. **Progress Made to Date:** Given the constraints of municipal bidding, environmental reviews, stakeholder interests, and the diversity and complexity of the program, the panel concurs that the progress made to date is reasonable for a multibillion-dollar program for a large municipality.
Key Open Issues:

- Lines of authority and decision-making
- Sustaining the improved business practices established over the past few years
- Succession planning (backup plan and retention)
- Technology transfer across the SFPUC staff
- Does the Program Construction Management (CM) Advisor from AECOM have enough staff and is the role properly defined?
- Can the program scale up to support the magnitude of the future spending plan?

Observations

- The City’s reputation among contractors has dramatically improved over the past few years. Contractors that have worked previously with the SFPUC recognize the new procedures around streamlining procurement and payment.

- The SFPUC is generally perceived as having a high level of professionalism; public support appears quite high, both from citizens and from regional providers. While the SFPUC continues to have its critics, the WSIP is providing an opportunity to create additional credibility with the SFPUC stakeholders.

- The Bay Area Water Supply and Conservation Agency (BAWSCA) recognizes significant improvement in the SFPUC’s program delivery capability. BAWSCA is committed to assist WSIP in delivering the program.

- In 2010, construction work on the regional portion of the WSIP will be ramping up significantly. Based on the information that the panel reviewed, during FY 08-09, $49.8M was expended ($4.15M/month). This increases to $196M for FY 09-10 ($20.8M/month) and reaches a peak in FY 11-12 of $685.6M ($40.8M/month). The next few years are critical as the program ramps up from the current monthly expenditures to a five-fold increase for the coming fiscal year (FY 09-10) and doubles again in FY11-12.

- The historic program costs and associated changes, starting with the 2002 baseline budget and schedule through the current projections, should be documented by the SFPUC. Obviously, the historic and current program configurations and costs are of great interest and would provide continuity and clarification to the wide variety of SFPUC stakeholders.

- The SFPUC is among the very few utilities that have ever undertaken a program of this magnitude; consequently, reliance on previous programs’ best practices is important.

- We believe the SFPUC has put a lot of thought into the organization, systems, and processes to accomplish the work. The SFPUC systems, processes, and staffing to meet the program needs are impressive, including the implementation that has occurred over the past few years.

- Overall, the program is well defined and, as discussed previously, well supported.
Union relations are positive and engaged because of the SFPUC’s efforts.

Water system shutdowns are a major concern, but they are being comprehensively addressed by the SFPUC regarding level of planning; early notification; detailed processes; and pre-shutdown testing (“dress rehearsals”) to verify condition of equipment, contingency planning, and overall coordination between construction and operational schedules.

The Construction Management Information System (CMIS) that has been developed and put in place for the WSIP is impressive; it is on the leading edge for managing programs of this type. It is very visible in the industry and is of interest to other utilities as well.

The effort to revise the Division 0 and Division 1 construction contract specifications is another indication that the SFPUC is working to make construction contracting more streamlined and consistent.

Level of Service (LOS) goals have been established for the program and have been used to help justify the need for specific projects.

Program staffing has improved, both from an internal and an external perspective, focusing on opportunities to improve staff development through successful participation on project work using the new procedures and tools developed for the WSIP. The SFPUC needs to continue to take advantage of these technology transfer opportunities.

Top talent has been hired in key SFPUC staff positions, which is critical to a program of this magnitude. The SFPUC has also ensured that consultants have put top staff into their key positions.

**Risks and Challenges**

*Note: In the panel’s view, the items listed here could present the greatest risks to the program. We recognize that the SFPUC is aware of and is actively addressing a number of these items. However, each of the items, if not adequately addressed, could present a major risk to the WSIP. The risks listed below are the highest priority risks that need to be monitored.*

- **Management of water system shutdowns.** Failure of a planned shutdown can significantly delay other projects. Some shutdowns are critical and can only be performed once a year.

- **Construction delays due to environmental requirements or modifications.** For example, Crystal Springs shutdown and U.S. Fish & Wildlife Service modification approval.

- **Pre-construction environmental delays.**

- **Contractor performance, quality, and claims in a low-bid climate.** Due to the economic slowdown, contractors are bidding very competitively, resulting in very low bids. The contractors could potentially be very aggressive in attempting to cut costs or recover costs through change orders.
- Seismic/weather/equipment (such as delivery of Owner-provided valves) factors have the potential to impact shutdowns.
- Failure of the field teams (both contractors and SFPUC) to accurately prepare and effectively use CMIS reports. If data for CMIS is not entered in a timely manner or correctly, management and control on a program basis may be compromised.
- Turnover of key program personnel, both from the SFPUC and its contractors/consultants.
- Maintaining the trust and support of long-term City employees who have been put in key assignments by providing the requisite level of support to help them grow and succeed. This is another opportunity for the SFPUC to provide technology transfer opportunities.

**Recommendations**

**WSIP Organization**

1. Hold frequent, in-person status meetings between the Assistant General Manager–Infrastructure (AGM–Infrastructure), WSIP Director, WSIP Construction Deputy Director, Program Construction Management Advisor, and others (as appropriate). This could be further reinforced by co-locating the program management and construction management teams.

2. Clarify lines of authority and decision-making, particularly within the Construction Management Program. This may be in the Construction Management manual, but it needs to be made clear throughout the organization. As an example, where does the WSIP Construction Deputy Director’s authority stop and what decisions need to go to the WSIP Director for final approval?

3. Create and maintain a backup plan for key personnel replacement.

4. Give office engineers Construction Management professional development opportunities during program construction.

5. Evaluate capability, periodically, to staff the WSIP (both SFPUC and key consultants/contractors) over the length of the program.

6. Reinforce the use of improved business practices through continued standardization, training, and performance rewards.

7. Continually identify opportunities to enhance work relationships/interfaces between SFPUC and consultant staff.

**Systems, Procedures, and Business Processes**

8. Continue shutdown sequencing planning and implementation process.

9. Be responsive to construction issues to minimize the cost impacts of change orders.

11. Continue to monitor staff performance against the established program procedures and metrics (CMIS).

12. The potential for delays related to permitting continues to exist. The SFPUC has had past success with program permitting and should increase these efforts to mitigate further delays.

**Reporting of Status and Delivery Performance**

13. Create periodic performance evaluations for consultants and contractors.

14. Communication with Commission:
   - Develop an orientation program for new Commissioners, and existing Commissioners as needed, where each Commissioner is offered a one-on-one program timeline briefing from 2002 to present to explain clearly the WSIP changes and budget adjustments.
   - Realizing that the WSIP has limited time with the Commissioners, ensure the dialog is maintained between the WSIP Team and the Commission. Continue to look for opportunities to improve communication, so that Commissioners maintain their understanding of the WSIP and can respond appropriately to constituent concerns.
   - Encourage informal meetings with individual Commissioners to brief them on current programmatic issues that may come up in bimonthly meetings.
   - Make CMIS presentations available to the Commission. The CMIS is a sophisticated program tracking system and these presentations will provide the Commission with system knowledge and confidence in the overall WSIP schedule and budget monitoring.

15. Review existing City fraud policies for applicability to WSIP.

16. Performance Reporting:
   - Report % complete in the monthly report by progress against schedule and budget (earned versus planned dollar amounts).
   - Make financial history of the program more transparent.
   - Keep Commissioners up-to-date using a monthly summary that informs them of achievements and the action status of pending issues or problems.
   - Prepare a rolling four-quarter look-ahead for WSIP Management and the Commission that keeps focus on the highest-priority items to be accomplished in upcoming quarter(s).
   - Review the existing Quarterly Report for its utility and value and consider modifying its format.
- Make sure presentations to the Commission cover accomplishments and challenges, as well as cost and schedule information.

**Progress Made to Date**

17. Maintaining “reasonable progress” can be monitored by establishing an independent audit panel that consists of industry experts in areas including project management, construction management, quality assurance, and project controls for mega-projects. Given the number of oversight bodies (local and state) already in place, this may provide a more streamlined review process if this panel were to forward its results to other existing oversight bodies. This panel should report to the General Manager and Commission two or three times per year. (Note: While this may seem to be a duplicate effort, this type of review is most useful during the next 12 to 18 months and will have served its purpose when the program reaches its 2012 peak in construction activity. Once the peak construction activity has successfully been reached, the audit panel’s efforts could be reduced or eliminated.)

18. Given the magnitude of the program and risks, the SFPUC should recognize that it might need a contingency plan for extending the schedule due to factors beyond its control. This should preferably result in a new forecast, and not a new baseline.
Report of the WSIP Independent Review Panel

Background and Scope
The San Francisco Public Utilities Commission (SFPUC) is in the middle of its $4.6 billion, multiyear Water System Improvement Program (WSIP) and is beginning to embark on the largest volume of construction in the program. The WSIP is transitioning from planning and design of the majority of all of the projects and construction of the smaller San Francisco-based projects to construction of the program’s larger, regional projects.

In 2010, construction work on the regional portion of the WSIP will be ramping up significantly. Based on the information that the panel reviewed, during FY 08-09, $49.8M was expended ($4.15M/month). This increases to $196M for FY 09-10 ($20.8M/month) and reaches a peak in FY 11-12 of $685.6M ($40.8M/month). The next few years are critical as the program ramps up from the current monthly expenditures to a five-fold increase for the coming fiscal year (FY 09-10) and doubles again in FY11-12.

The SFPUC hired a five-member independent panel to review the WSIP and answer six key questions:

1. Is the WSIP organization adequate to deliver the program?
2. Are the systems, procedures, and business processes used to deliver the WSIP adequate?
3. Are the status and delivery performance of the WSIP being reported adequately and accurately?
4. Is the progress made to date on the WSIP reasonable?
5. What are the greatest challenges and risks that could impact program delivery?
6. What steps or actions does the panel recommend the Commission and/or upper management take to promote accountability, minimize risks, and guarantee success?

The review panel consisted of the following members:

- **Russell J. Stepp, P.E. (Panel Chairperson)**
  President and Project Manager of R. W. Beck, Inc. For R. W. Beck, Mr. Stepp led the independent engineering review of the SFPUC’s $3.6 billion Capital Improvement Program in 2002.

- **John W. Kluesener, Ph.D.**
  Principal, Infrastructure Systems Consulting, and former Bechtel Program Manager for SFPUC CIP

- **James G. Mueller, P.E.**
  Deputy Commissioner and Director, Facilities Planning and Design, New York City Department of Environmental Protection
- **Douglas A. Selby, P.E., Ph.D.**  
  *Former Las Vegas City Manager and Director of Las Vegas Valley Water District and Southern Nevada Water Authority*

- **John E. Somerville, P.E.**  
  *Former President of AECOM / Metcalf & Eddy*

The panel reviewed numerous WSIP reports and documents, and conducted a one-week onsite review at SFPUC offices December 7–11, 2009. The onsite review included interviews with SFPUC staff, a BAWSCA representative, members of the public, Commissioners, and construction contractors.

**Methodology**

The panel members conducted their fact-finding onsite at SFPUC Headquarters in San Francisco from December 7 to 11, 2009. Several weeks prior to this 5-day onsite visit, the SFPUC provided the panel members with hard copy and online access to documents (listed below) that would assist them in their assessment of the WSIP. The panel also reviewed these documents during and after their onsite visit at their discretion.

In addition, the panel was offered presentations/demonstrations by SFPUC staff on the following subjects: Construction Management Program; Program Control; Construction Management Information System; Planning and Implementation of System Shutdowns; Environmental Review, Permitting, and Mitigation; Public Outreach, Contractor Outreach, Communications, and WSIP Website; Procurement Process; and Records Management/Document Control.

The onsite visit consisted of closed-door panel discussions interspersed with interviews with individuals requested by the panel. A limited number of interviews/meetings were pre-arranged by the SFPUC for the panel and these items are indicated by * in the following summary:

**Day 1**
- Overview of the WSIP provided to the panel by the WSIP Director*
- Roundtable discussion involving the panel and the WSIP Senior Management Team*
- Meeting and dinner involving the panel and SFPUC Senior Management*

**Day 2**
- Interviews and demonstrations requested by the panel
- Meeting with SFPUC Commissioner Anson B. Moran*
- SFPUC Commission Meeting*
- Meeting with Bay Area Water Supply and Conservation Agency General Manager Art Jensen*
- Meeting with SFPUC Citizens Advisory Committee Members Jennifer Clary and Lunila Harris*
- Meeting with Tuolumne Trust Member Jesse Rader*
**Day 3**
- Interviews and demonstrations requested by the panel
- Meeting with community members Steve Lawrence and Brian Browne*
- San Francisco Board of Supervisors Budget and Finance Committee Meeting*
- Phone Conference with SFPUC Commissioner Ann Caen*
- Phone conferences with various contractors

**Day 4**
- Interviews and demonstrations requested by the panel
- Phone conferences with various contractors
- Tour of New Crystal Springs Bypass Tunnel
- Panel’s drafting of preliminary findings

**Day 5**
- Presentation of the panel’s preliminary findings to SFPUC Senior Management*

**Documents Provided**
- Official Statement for San Francisco Water Revenue Bonds (SFPUC, 09/01/09)
- WSIP Quarter 1 / FY09-10 Quarterly Report for Regional Projects (SFPUC, 11/19/09)
- WSIP Annual Report (SFPUC, 09/01/09)
- June 2009 Revised WSIP Notice of Changes Report (SFPUC, 09/01/09)
- December 2005 WSIP Notice of Change (SFPUC)
- December 2007 WSIP Notice of Change (SFPUC)
- WSIP Assessment by Parsons (Parsons)
- WSIP Organizational Charts (SFPUC, dates vary)
- WSIP Program Implementation Report (Parsons/CH2MHiLL, 12/09/05)
- Quality Management Directive (SFPUC, 06/29/06)
- WSIP Construction Management Plan – Revision 3 (SFPUC, March 2009)
- WSIP CM Procedures – Table of Contents – Revision 12 (SFPUC, October 2009)
- WSIP Risk Assessment (Parsons, September 2007)
- WSIP Risk Mitigation Action Plan (SFPUC/Parsons, March 2008)
- Tesla Treatment Facility Construction Risk Register (PMA, 10/26/09)
- WSIP Program Baseline, 2007 (SFPUC, 02/26/08)
- June 2009 Revised WSIP Construction Budget (SFPUC, June 2009)
- WSIP Schedule Compression Memorandum (SFPUC)
- Quarterly in Brief (SFPUC)
- Quarterly Report PowerPoint Presentation (SFPUC)
- Quarterly Presentation to the Commission
- Program/Regional/Project Trend Reports (samples)
- Project Cost and Schedule Reports (samples)
- Activity-Level Cost and Schedule Variance Reports (samples)
The review culminates in this report to the Commission of the panel’s observations, conclusions, and recommendations.

**WSIP as a Mega-Project**

While there are many perspectives on how well the program has been managed and executed to date, and on whether the program has been or is a success, the panel would like to make one point clear. This program is larger than and unlike any effort the SFPUC has taken to date.

The panel feels that the WSIP is a “mega-project” and should be judged in the context of other such projects. Few water programs match the scale and complexity of the WSIP. Only a handful of multibillion-dollar infrastructure programs are underway in the United States at any one time. These programs face challenges that are orders of magnitude larger than the typical public works construction project and to be successful they require, among other things, an experienced and capable management team, adequate funding, good designs, responsible construction contractors and equipment suppliers, robust scheduling and project controls systems, and an ability to respond to changed conditions without jeopardizing overall program schedules. The WSIP is further complicated by the need to make substantial improvements to tunnels, pipelines, reservoirs, and treatment facilities while maintaining water service to a population of over 2.5 million people, meeting strict environmental requirements, and working within the constraints of municipal bidding procedures. As with other mega-projects, the WSIP should be considered one that will face numerous risks and challenges that may affect its ultimate cost and completion schedule.

A project of this magnitude, with multiple variables, regardless of how well it is monitored or controlled, will inevitably suffer from some unforeseen impacts. However, the WSIP Team appears to be prepared to address those circumstances.

**Question 1**

**Is the WSIP organization adequate to deliver the program?**

**Observations:**

- **Senior team seems well qualified and committed to the program.** In the panel’s view, the SFPUC has employed the “A team” for this program both with its own staff and the consultants and subcontractors it has selected. The senior team was open with information and seemed well qualified, knowledgeable, confident, and committed to a successful program.

- **The WSIP is in transition from design to construction, and from smaller local program to larger regional program.** The SFPUC local program cash flow will significantly increase as the regional program is implemented. The ability to ramp up will be indicated by monitoring the progress in the monthly report against schedule and budget.
Team organization has been defined but functional operation of the team is still being sorted out and standardizing operations across the program is still in progress. With an integrated team consisting of many SFPUC and consultant staff, the question of “who is in charge” during construction came up several times in our conversations. Our observation is that the Site Construction Management (CM) team(s), supported by the WSIP Construction Deputy Director, the Regional Project Managers, and the Regional Construction Managers, are in the lead decision-making position for construction activities. This needs to be communicated regularly and consistently.

The SFPUC appears to have adequate staff to input the needed information into the Construction Management Information System (CMIS). The CMIS will depend on timely and accurate data entry. In our review, it seemed that the SFPUC recognized and addressed this with the assignment of staff at each project site to perform this work.

**Question 2**

Are the systems, procedures and business processes used to deliver the WSIP adequate?

**Observations:**

In its review, the panel recognizes the following actions the SFPUC has taken or is taking in preparing its organization to implement the WSIP:

- The organization has made smart investments in state-of-the-art systems, standardized procedures, and streamlining of business processes.
- The program controls group, as currently organized, is adequate for the preconstruction phase and for reporting status to the public.
- The CMIS has been developed to track cost issues, change orders, etc., during the construction phase.
- The SFPUC is in the process of developing a construction-focused control system using P6 (Primavera Enterprise Project Portfolio Management) to capture contractor-generated schedule during the construction phase. That system will be integrated with the WSIP Program-Level P6 Control System.
- The high-level project controls systems that WSIP is implementing are a significant benefit, as previously mentioned, but it should also be recognized that it will take time for the ramp-up and integration to happen and for the systems to become part of the day-to-day operations.
- Prequalification of potential construction contractors is standardized, encourages local participation, and attempts to minimize performance risk.
- Partnering approach with site team and contractor is an effective way to bring integrated teams together with management to instill in them the WSIP systems, processes, and objectives.
- Project labor agreement (PLA) is in place.
- The risk management assessment tool is currently being implemented and needs to be further defined in how it will be applied to the WSIP projects. Risk management tools can be very valuable but if overused could become additional effort that does not return the desired value.
- Program control tools and systems need to be used in a disciplined way to manage projects and avoid risks.
- It is our understanding that the role of the Program CM Consultant (AECOM) is to conduct regular onsite project audits to verify compliance with the CM Plan, all CM procedures and business processes, and the quality of data input into the CMIS program.

**Question 3**

**Are the status and delivery performance of the WSIP being reported adequately and accurately?**

**Observations:**

- The current program schedule and budget performance is based on the WSIP 2009 re-baselining effort. However, it would be desirable to maintain the program’s historic record starting with the original 2002 baseline through the evolution of the current WSIP based on the 2007 efforts. This is valuable to maintain the program history regarding schedule and budget so that as Commissioners change or stakeholder concerns emerge it is easy to track how and why the program has evolved. Obviously, the historic and current program configurations and costs are of great interest and clarification to the wide variety of SFPUC stakeholders.

- **Quarterly reports are out-of-date when published (6 to 8 weeks later).** The quarterly reports, because of the extensive effort needed to produce them and make them accurate, reach the Commissioners too late for them to make timely decisions. The panel also heard comments that the quarterly reports provide more depth and detail than the Commissioners need to receive on a regular basis. It may be worthwhile to evaluate the value of these extensive quarterly reports and determine if something less in depth and more easily developed may serve just as well.

- **The SFPUC captures all critical data on the WSIP.** It is clear to the panel that the SFPUC has put systems into place to capture a tremendous amount of information on the key aspects of the WSIP. This is a good sign, as it indicates the SFPUC has the raw data available to produce whichever type of reporting that it determines is most helpful to the Commission and others.

- **Percent complete is reported based on the number of projects.** The reports to the Commission focus on the percent completion based on the number of projects, regardless of project size. Using this approach, several small successful projects can mask a delay on a large project.
Question 4
Is the progress made to date on the WSIP reasonable?

Observations:

- **Since 2002, significant progress has been made in all phases of the program, given its large scale.** Back in 2002 the initial Capital Improvement Program (CIP) was being developed and the associated SFPUC organization to support the effort. Fast forward to 2009 and the WSIP is the result, with business systems and processes, excellent staffing efforts, and the overall organization to position the SFPUC for implementation. Many doubters of 2002 have become the supporters of 2009.

- **The panel recognizes significant improvement in the SFPUC’s ability to execute a program of this magnitude.** Systems, organization, and staffing framework to deliver the program have been put into place. These elements are the critical foundation to implementing a successful program. The ramp-up into the full construction mode is always a challenge; however, the WSIP appears to be prepared to meet it.

- **Approximately half of the original set of local projects has been completed.** The local projects have started slowly but increased progress has been made over the past few years to complete these projects. Those projects have been completed without the benefit of the more recently developed programmatic procedures and processes.

- **Significant progress has been made on the regional projects.** This includes the following activities:
  - Programmatic Environmental Impact Report was completed successfully.
  - Design of the regional projects was 80% complete by October 2009 and is expected to be 95% complete by June 2010.
  - As of the end of September 2009, $515M in projects is currently in the bid and award phase.

Question 5
What are the greatest challenges and risks that could impact program delivery?

*Note: In the panel’s view, the items listed here could present the greatest risks to the program. We recognize that the SFPUC is aware of and is actively addressing a number of these items. However, each of the items, if not adequately addressed, could present a major risk to the WSIP. The risks listed below are the highest priority risks that need to be monitored.*

- Management of water system shutdowns.
- Construction delays due to environmental requirements or modifications. (For example, Crystal Springs shutdown and U.S. Fish & Wildlife Service modification approval.)
- Pre-construction environmental delays.
- Contractor performance, quality, and claims in a low-bid climate. Due to the economic slowdown, contractors are bidding very competitively, resulting in very low bids. The contractors could potentially be very aggressive in attempting to cut costs or recover costs through change orders.
- Seismic/weather/equipment (such as delivery of Owner-provided valves) factors have the potential to impact shutdowns.
- Failure of the field teams (both contractors and SFPUC) to accurately prepare and effectively use CMIS reports. If data for CMIS is not entered in a timely manner or correctly, management and control on a program basis may be compromised.
- Turnover of key program personnel, both from the SFPUC and its contractors/consultants.
- Maintaining the trust and support of long-term City employees who have been put in key assignments by providing the requisite level of support to help them grow and succeed. (This is another opportunity for the SFPUC to provide technology transfer opportunities.)
- Adequacy of bidding documents where there is split design responsibility between the SFPUC and consultants.
- Protests to procurements/awards.
- Timely response to contractor requests for information (RFIs), change orders (COs), etc.
- Right-of-way acquisition.
- Permits (both project-level and construction-level).
- Personnel interfaces between SFPUC staff and consultants.
- Ability of CM organization to ramp up successfully.
- Sufficient engagement of SFPUC management in monitoring WSIP construction program and issues.
- Commission’s full understanding of WSIP progress and changes to date and the CM program as it advances.
- Aggressive schedule with majority of work yet to be bid.
- Owner-supplied equipment for construction or shutdowns.
- Insufficient focus on near- and long-term challenges that are critical to meeting schedule and budget.
Question 6
What steps or actions does the panel recommend the Commission and/or upper management take to promote accountability, minimize risks, and guarantee success?

WSIP Organization

1. **Hold frequent, in-person status meetings between the Assistant General Manager–Infrastructure (AGM–Infrastructure), WSIP Director, WSIP Construction Deputy Director, Program CM Advisor, and others (as appropriate).** With the rapid pace of construction and other program activities, the WSIP Director must have regular personal contact with key team members, especially the WSIP Construction Deputy Director. Due to the geographical spread of the projects and the frequent travel, it will take specific coordination to ensure this status meeting receives a high priority. This could be further reinforced by co-locating the WSIP Director, CM and Project Controls, and their supporting staffs.

2. **Clarify lines of authority and decision-making, particularly within the CM Program.** This may be in the CM manual, but it needs to be made clear throughout the organization. (As an example, where does the WSIP Construction Deputy Director’s authority stop and what decisions need to go to the WSIP Director for final approval?) The CM organization is complex, with three tiers of project managers and construction managers (Program, Regional, and Project tiers). If lines of authority are not regularly reiterated and reinforced, teams tend to develop “informal” lines of authority. The WSIP Director and WSIP Construction Deputy Director should use regular meetings and trainings as an opportunity to reinforce this issue.

3. **Create and maintain a backup plan for key personnel replacement.** The top talent that the WSIP has deployed is critical to the program’s success. Therefore, the loss of one key person could greatly affect project schedules. Make sure potential replacement personnel are identified and groomed should a key person retire or leave the program for other reasons.

4. **Give office engineers CM professional development opportunities during program construction.** The WSIP will be a signature accomplishment in the careers of many up and coming professionals. In particular, the young engineers who have seen the projects through the design phase can gain experience that will prepare them for future leadership positions in the SFPUC.

5. **Evaluate capability, periodically, to staff the WSIP (both SFPUC and key consultants/contractors) over the length of the program.** The SFPUC should look forward to several future years (such as 2010, 2014, 2018, and 2020) and prepare to maintain adequate staffing and leadership, given the potential for changes in workload, promotions, retirements, and other events. This effort should lead to decisions such as recruitment as well as targeted training and
development of key SFPUC staff who can move into anticipated roles (an opportunity for technology transfer).

6. **Reinforce the use of improved business practices through continued standardization, training, and performance rewards.** When an organization implements the amount of change that the SFPUC has seen over the past decade in preparation for WSIP implementation, there are bound to be various instances of resistance and backsliding. The SFPUC Executive Team should continue to reinforce the changes it has made and prevent backsliding.

7. **Continually identify opportunities to enhance work relationships/interfaces between SFPUC and consultant staff.** The CM organization involves numerous consultants and teams that combine SFPUC and consultant staff. While this is necessary to the success of the program, it also provides any number of opportunities for conflict and personality clashes. The WSIP Construction Deputy Director should monitor for troublesome situations and address these situations, and reassign personnel when needed, to maintain effective CM teams.

**Systems, Procedures, and Business Processes**

8. **Continue shutdown sequencing planning and implementation process.** SFPUC’s work to plan for shutdowns and minimize risks (for example, by staging “dress rehearsals” before the shutdown is needed) is prudent and impressive. This effort should continue to receive high priority and attention.

9. **Be responsive to construction issues to minimize cost impacts of change orders.** The SFPUC should stay vigilant to issues that could lead to change orders. It should also be fair in accepting justifiable change orders. Managing these issues effectively and treating them with importance will go a long way toward maintaining effective relationships with contractors and achieving timely performance overall.

10. **Conduct an independent test/audit of the CM organization and systems in mid-to-late 2010 to verify performance.** Because the CM organization is at the beginning of a steep ramp-up in volume of work, it would be prudent for the SFPUC to commit to evaluate it shortly after the large projects have begun. At that time, the organization can be adjusted to address any problems that have become evident once the organization has been put to the test.

11. **Continue to monitor staff performance against the established program procedures and metrics (CMIS).** To ensure adoption of the CMIS the use of this tool should be part of the SFPUC staff performance review.

12. **Consider increasing the SFPUC permitting efforts for all projects.** The permitting group should ensure that it is following the permitting from the preliminary project stages through construction and monitoring the mitigation as needed. The potential for delays related to permitting continues to exist. The SFPUC has had past success with program permitting and should increase these efforts to mitigate further delays.
Reporting of Status and Delivery Performance

13. Create periodic performance evaluations for consultants and contractors. It would be valuable for the SFPUC to provide performance evaluation for both their contractors and consultants. These should be shared directly with senior management of the respective contractors/consultants as well as the assigned lead manager. It would let the contractors and consultants have a better understanding of what is expected by the SFPUC when they are engaged on current and future SFPUC projects.

14. Communication with Commission:

- Develop an orientation program for new Commissioners, and existing Commissioners as needed, where each Commissioner is offered a one-on-one program timeline briefing from 2002 to present to clearly explain the WSIP changes and budget adjustments. The SFPUC currently offers a number of opportunities for new Commissioners to hear briefings, make site visits, and learn about the utility. It may be useful to review this program and make sure it is comprehensive and consistent. The panel recognizes the challenge of making a structured orientation that is at the same time brief and digestible, yet comprehensive and informative, but it is critical that SFPUC staff provide new Commissioners with a knowledge base on which to make informed decisions about WSIP.

- Ensure the dialog is maintained between the WSIP Team and the Commission and continue to look for opportunities to improve communication, so that Commissioners maintain their understanding of the WSIP and can respond appropriately to constituent concerns. Because the WSIP has limited time with the Commissioners, it is essential that the time be spent efficiently. The Commission also has many relatively new members who are just gaining an understanding of the current WSIP. It would be beneficial to have additional formal and informal discussions with Commissioners to maintain their program understanding.

- Encourage informal meetings with individual Commissioners to brief them on current programmatic issues that may come up in bimonthly meetings. Make sure Commissioners know they can get needed information prior to public meetings.

- Make CMIS presentations available to the Commission. The CMIS is a sophisticated program tracking system and these presentations will provide the Commission with system knowledge and confidence in the overall WSIP schedule and budget monitoring.

15. Review existing City fraud policies for applicability to WSIP. The panel acknowledges that the SFPUC has policies in place to detect and prevent fraud. Because the WSIP is larger than any of the SFPUC’s previous programs, the panel suggests that the policies be reviewed with the WSIP in mind and modified, if necessary, to make sure they will be effective in such a large program. To be
clear, the panel does not suspect any fraud and did not receive any reports or indications of fraud in its review. This recommendation is made simply because the risk of fraud can increase due to the increased size of the program.

16. **Performance Reporting:**

- Report % complete in the monthly report by progress against schedule and budget (earned versus planned dollar amounts).
- Make financial history of the program more transparent.
- Keep Commissioners up-to-date using a monthly summary that informs them of achievements and the action status of pending issues or problems.
- Prepare a rolling four-quarter look-ahead for WSIP Management and the Commission that keeps focus on the highest-priority items to be accomplished in upcoming quarter(s).
- Review the existing Quarterly Report for its utility and value and consider modifying its format.
- Make sure presentations to the Commission cover accomplishments and challenges, as well as cost and schedule information.

**Progress Made to Date**

17. **Maintaining “reasonable progress” can be monitored by establishing an independent audit panel that consists of industry experts in areas including project management, construction management, quality assurance, and project controls for mega-projects.** Given the number of oversight bodies (local and state) already in place, this may provide a more streamlined review process if this panel were to forward its results to other existing oversight bodies. This panel should report to the General Manager and Commission two or three times per year. (Note: While this may seem to be a duplicate effort, this type of review is most useful during the next 12 to 18 months and will have served its purpose when the program reaches its 2012 peak in construction activity. Once the peak construction activity has successfully been reached, the audit panel’s efforts could be reduced or eliminated.)

18. **Given the magnitude of the program and risks, the SFPUC should recognize that it might need a contingency plan for extending the schedule due to factors beyond its control. This should preferably result in a new forecast, and not a new baseline.**

- SFPUC staff and Parsons and AECOM consultants support the current schedule.
- Based on the steep rise in construction spending, the dispersed nature of the projects, and the use of new (to many SFPUC staff) and sophisticated project procedures and tools, the panel feels the SFPUC’s schedule is aggressive.
• Current support of the schedule may be warranted because while the dollar value of the projects is increasing, the number of regional projects the SFPUC is taking on is similar to the number of projects it has been accomplishing under the local projects portion of the WSIP.

Panel Conclusion

In conclusion, the independent review panel wants to recognize the SFPUC senior management, WSIP management and staff, WSIP consultants, WSIP project contractors, BAWSCA, SFPUC stakeholders, and City staff, who were cooperative and supportive of the panel’s efforts. It should be recognized that the panel’s review time was limited and focused exclusively on gathering the essential information to answer the six questions contained in this report. Overall, the panel is impressed by the SFPUC’s ability to build such a comprehensive program and implementation system.