



bay area water/wastewater
workforce reliability

INTER-AGENCY USE OF VIDEOCONFERENCING
TO SUPPORT STAFF TRAINING

BAYWORK

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I. BACKGROUND

BAYWORK, a consortium of water/wastewater utilities collaborating to improve workforce reliability, works from a Roadmap that includes four strategic objectives:

- Develop qualified candidates for mission-critical job categories;
- Provide staff with the information needed to do quality work;
- Modify work processes to optimize use of staffing available; and
- Collaborate with others to improve the cost-effectiveness of workforce reliability investments.

Videoconferencing has been investigated by BAYWORK because of its potential to address three of these objectives. First, videoconferencing provides a potential vehicle for delivering information (e.g., soft skills, health and safety, or technical training) to employees. Second, any form of staff training is a work process that requires staff time; training classes often require travel time in addition to in-class time. Videoconferencing allows employees to obtain training simultaneously at multiple sites, reducing travel time and therefore increasing the productivity of current employees. Third, videoconferencing offers the opportunity for agencies to offer training more cost-effectively by sharing the costs associated with paying an instructor to teach a class.

Although some of these benefits are also available through use of webinars, videoconferencing offers features not available through the typical webinar format. Instructors and students from multiple locations can see and hear each other, so that students tend to stay more engaged, instructors can gauge the degree to which students are absorbing information, and both teachers and students can ask and answer questions.

II. BAYWORK PILOT TESTS

Because of the potential benefits, BAYWORK has conducted several pilot tests of multi-agency training using videoconferencing.

In 2011, BAYWORK used videoconferencing to support providing a health and safety class on Heat Safety at two facilities of the San Francisco Public Utilities. Although both SFPUC and staff of other BAYWORK agencies participated in the test, both sites relied on the SFPUC's videoconferencing system.

In 2012, BAYWORK tested use of videoconferencing to transmit technical training on water quality regulations. The training was provided at East Bay Municipal Utility District, by EBMUD's Manager of Planning Analysis for Water Quality. The training was received by students in three locations:

East Bay Municipal Utility District (Oakland);
San Francisco Public Utilities Commission (Sunol); and
Metropolitan Water District (Los Angeles).

Staff members from five water/wastewater agencies participated in this test.

In 2013, a videoconferencing pilot project involving EBMUD, SFPUC, and MWD videoconferencing capabilities was tested at four sites:

- SFPUC's Sunol Valley Filtration Plant, where the instructor was located;
- SFPUC's Milbrae Headquarters (where additional students were located);
- an EBMUD location; and

- an MWD location.

Although videoconferencing connection capabilities were tested in four sites, student training occurred at only two. This reflected several complexities associated with this pilot test:

- The instructor who taught the Flagger Training course was a contracted vendor rather than an agency employee; since the instructor was unwilling to provide his course material to MWD for preview, MWD did not assign its employees to attend the class;
- The course was being taught at an SFPUC facility rather than an EBMUD facility; and software/security protocol issues prevented the EBMUD location from receiving content; and
- The course was constructed to include proctor supervision at each site, and proctored administration of a post-test to insure that students had successfully learned the information presented on the course.

The purpose of this report is to document lessons learned from these pilot tests, document issues that water/water agencies should consider in relation to use of videoconferencing to support staff training, offer suggestions on how to improve use of this tool, and make recommendations regarding its future use as a component of water/wastewater utilities' staff preparedness programs.

III. LESSONS LEARNED

Because videoconferencing is a relatively new mechanism for delivery of staff training, most water/wastewater utilities that have this technology are still learning to use it effectively. Considerations in delivering training using this technology are suggested below.

- Video-conferencing technology has improved, but still requires a high level of IT support, particularly when multiple agencies are involved.
- Use of a contractor to provide the training (rather than an in-house employee) generates additional administrative complexities.
- Equipment needs to be purchased that supports the training need (e.g., monitors must be large enough to be seen in all parts of the training room).
- Utilities need to purchase equipment and software and implement policies that are conducive to information-sharing and collaboration among agencies in order to maximize the potential of this technology to reduce staff training costs.
- Instructors need to become more sophisticated with the use and constraints of videoconferencing in order to maximize its potential for multiple-site staff training.
- Additional research is needed in order to further explore the potential for regional use of videoconferencing to increase the cost-effectiveness of staff training investments.
This research should include the potential value of incremental improvements to systems already in place (at EBMUD and the SFPUC) to allow them to communicate more effectively, as well as analysis of the potential cost-effectiveness

of investing in additional compatible nodes at other regional water/wastewater facilities.

Appendix I to this document provides specifics from the 2013 pilot test which illustrate these issues, and includes some suggestions for how they can be addressed.

IV. CONCLUSIONS AND RECOMMENDATIONS

The use of video technology in distance learning is a proven process. Adoption by agencies could result in:

- Significant savings in travel costs;
- Reduction in time away from work; and
- Ability to share training events with other agencies, to save training expenses.

As agencies expand in their use of videoconferencing technology, they can be expected to improve in their ability to facilitate, training both among their own employees and among multiple agencies. BAYWORK's proposed initiatives for FY2014-2015 do not include any specified use of videoconferencing. On the other hand, BAYWORK's proposed initiatives for FY2014-2015 include a Training Day that will include staff training in a mix of technical, health and safety, and soft skills, since this will itself be a pilot test of a new type of BAYWORK event and videoconferencing is complex in itself, adding videoconferencing to the plans for this new type of event would be premature. If the BAYWORK Training Day is successful for on-site training for multiple agencies, addition of videoconferencing to this event might be an option for future consideration.

BAYWORK will continue to consider both videoconferencing and other technologies to help us train our employees more cost-effectively.

APPENDIX I

Notes from 2013 BAYWORK Pilot Test of Video-Conferencing

Process	Observations	Recommendations
System start-up	The system start-up was performed by SFPUC IT staff at each location.	Ease of system setup and startup should be part of the criteria for system selection.
System Operation	<p>The number of IT staff available to support videoconferencing was limited. .</p> <p>After the start of a training session, touch nothing.</p> <p>Where video-conferencing systems are incompatible or internal security procedures block transfer of information, videoconferencing can be difficult. Non-SFPUC Network</p>	<p>Identify & train employees:</p> <ul style="list-style-type: none"> • At each location - or - • Who have the ability to support a location other than their primary work site. Users who do not operate the system frequently should plan extra time to practice and refresh their skills prior to each session. <p>Once the event has started, everyone should be aware not to change anything as this may cause the system to freeze.</p> <p>. Bay Area utilities should attempt to buy compatible systems or create bridges that will allow transfer of information among agencies.</p>
Audio Quality	<p>Participants at both locations could hear the instructor and be heard by the instructor. Participants could usually hear what was said by those at the other site when people spoke up. The multi-directional microphones are well suited to pick up audio from all participants.</p> <p>Audio was muddled when two or more people were speaking at the same time. This was a problem for interactions between the instructor and participants, and had a more significant adverse impact on the interactions between the participants at the two sites.</p>	<p>Build in time for a “technical” briefing for all participants before the start of each training to cover protocols for interactions with the instructor & attendees at other sites. Examples:</p> <ul style="list-style-type: none"> ▪ One speaker at a time ▪ Allow instructor to “moderate,” e.g. specify time for questions select/identify speakers ▪ Use break times and/or after-training time for side conversations. ▪ Place the microphone away from any table where the instructor or participants are seated, or on a padded surface to minimize ambient noise transmission through rigid surfaces (like the table).

	Ambient noise occurring near the microphone interfered with audio transmission. This included paper shuffling, cups being set on the table, etc.	Once videoconferencing becomes a more routine experience for all, these briefings can be abbreviated.
Video Quality	Overall video quality was quite good when viewed on a monitor. At both locations, ambient light affected video clarity – positively & negatively, as did the “background” colors. Details are important to identify speakers or see equipment clearly. At the SPUC, two cameras were available in the training room, and the monitor was of sufficient size. Video quality would not necessarily have been adequate at sites with undersized monitors.	<ul style="list-style-type: none"> ▪ Instructors & operators must practice with the system in advance to best understand what can be done to mitigate its limitations. ▪ All instructors, including contractors, must be briefed in advance to allow them to plan for each session, depending on its requirements, to maximize visibility for remote audiences. Elements to consider include: <ul style="list-style-type: none"> ▪ Wardrobe (e.g., all black or all white do not work well) ▪ Ability to control ambient lighting (from windows as well as overhead) ▪ Slides, DVDs or other electronically transmitted video must be tested in advance to assess quality & suitability. ▪ Sufficient cameras must be available to film action (two per room). ▪ Monitors must be sufficiently sized for viewing by all training participants.
Training Vendor	The pilot training was conducted by a vendor experienced in the instruction of the Flagger course.	Agency staff must ensure that all outside training contractors agree in advance to conduct their training for multiple audiences (this may impact the cost of delivery, especially when multiple agencies are involved). Contractors must receive instruction about the system’s operational requirements prior to delivering their training, and modify their training where necessary.
Training Effectiveness	<p>A Kirkpatrick (Kirkpatrick) Level One assessment was used.</p> <p>Use of assessments.</p>	<p>Attendee reaction to the training was positive. It was felt that learning did occur and they agreed that the process is sound and could be used to train.</p> <p>Both knowledge and skill assessments should be used to ensure learning transfer has occurred.</p>

	Assessment method	Build in assessments throughout the training rather than waiting until the end. Including assessment throughout keeps participants engaged, and helps the facilitator keep a pulse on the class.
Site Coordination	Designated site coordinators to handle administrative functions.	Each site should have a designated coordinator/proctor who is responsible for attendance and assessments. Expectations should be clear.
Positioning of Instructor	The instructor was positioned to the attendees right (Sunol) and to the left side of the screen (Millbrae).	The instructor should examine where they are visible and where they are not. At times, Millbrae did not see demonstrations of signals without asking the instructor to reposition. Instructor must be able to see the screen that shows the remote location to facilitate a face to face environment.
Personal Electronic Devices	Phones were heard throughout the training session.	Attendees should be asked to silence their phones during the training session. Ambient noise of phones makes it difficult to hear the instructor.
Input from remote site	Instructor acknowledgement of questions and input from the remote site.	The instructor needs to acknowledge the input and questions from the remote site attendees to enhance participation. Recommended instructor ask question to remote site: (e.g., "Millbrae, what are the?")