

Survey of Processes, Programs and Investments Required for Implementation of Effective Technical Training and Staff Development Programs

Purpose of the Survey

One of the primary challenges of the water/wastewater industry at this time is to provide the staff development and technical training programs needed by staff in order for them to perform quality work. The purpose of this survey is to document the processes that are being used by water/wastewater utilities that are doing outstanding work in this area, as well as the investments they are making in order to develop quality programs and products. These findings will be published in a BAYWORK report, and posted to the BAYWORK website, for the benefit of the water/wastewater industry.

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1. Please provide the following information about your utility:

a. Please check all functions provided by your utility.

Water	Wastewater	Power	Gas
	78		

b. How many staff members are employed by your utility?

78

c. Please describe how different types of training/staff development are handled in your organization, in terms of roles and responsibilities (with an organization chart to help illustrate, if possible).

The Littleton/Englewood WWTP (L/E WWTP) is an organization very reliant upon data and information that is accurate, reliable and easily accessed. To this end, computerized systems were upgraded beginning in 2000 with the goal of meeting this criteria and being integrated where possible. These systems provide the foundation for the knowledge management program. An overview of these systems will be presented, with in-depth descriptions and demonstrations of some of the applications key to the Knowledge Management Initiative throughout some of the other presentations.

The Knowledge Management Initiative, which was launched in 2007, focused primarily on the Operations Division, with the driver being the completion of the Phase 2 project, which resulted in an almost completely new plant with new equipment and a sharp operational learning curve for staff.

Prior to the beginning of the KM Initiative, certain assumptions and awareness items were identified. These assumptions and awareness items were presented to upper management and the facility governing Board. A strong commitment was made by the Board and upper management for this project. Getting this commitment was an important step to help ensure staff dedication and participation in the project. The following are the topics considered important for successful implementation of the Knowledge Transfer/Management Plan:

- ❑ *Operations Knowledge* is the collection of information, data, and procedures, which can be appropriately recalled to assist in observations, trouble-shooting, problem solving, or decision-making.
- ❑ Knowledge is valued as a vital asset in supporting successful operations and management appropriate resources and support shall be allocated.
- ❑ Management and staff will work together to promote knowledge transfer.
- ❑ Knowledge must be captured and stored in either an electronic or documented format, and be managed as a living, evolving process.
- ❑ Staff must be able to easily access information when necessary.
- ❑ All mission critical elements of the operations process must be captured.
- ❑ An environment of information exchange needs to be in place in which operators are willing to share information without feeling threatened by staff members eager to learn.
- ❑ The plant must have a person(s) dedicated to and responsible for the maintenance and administration of the knowledge management program.
- ❑ Information systems must be in place to support the knowledge management program.
- ❑ A dedicated schedule must be followed to ensure knowledge capture will occur before veteran staff retires.

KEY PLAN ELEMENTS FOR KNOWLEDGE TRANSFER

Knowledge Transfer is an enormous endeavor that needed to be broken into stages. The following presents each stage of the plan with a brief explanation:

- 1) *Promote the importance of knowledge management* - The importance of knowledge management needs to be championed at all levels of the plant; from the Utility Director to each Operator. Everyone must realize the significance of knowledge as an asset and its long-term impact on future plant operations. Promoting this awareness over the next five years can be achieved via meetings, the plant newsletter, presentations, “pep talks” from managers.
- 2) *Form a Knowledge Management Team (KMT) chaired by the Process Specialist* - Change occurs best if more people own the outcome. In addition, by using the concept of “divide and conquer”, tasks can be divided amongst more resources, as opposed to the entire burden falling on the one individual. The team consists of an operator and supervisors who will be responsible for documenting the knowledge for their assigned area. This team will meet on a monthly basis to determine what needs to be documented, how, when, and by whom. Also, could be tied to additional pay if outcomes are met.
- 3) *Tie knowledge management to pay for performance* - In order to increase participation, pay can be used as an incentive. For example, each employee can be given a target of SOPs to complete for the year. If that target is met, they receive a higher rating in that section of their evaluation.

4) Identify knowledge content elements by plant areas - A list of all the various process areas, procedures, troubleshooting techniques, preventative maintenance methods, and key knowledge areas need to be compiled by the KMT. This list serves as the guide for the entire knowledge management project with each area owner responsible for completing his or her portion of the list. This list should be updated on a regular basis.

d. If your utility has access to any communication technology that would allow for remote participation by SFPUC staff in this site visit (e.g., teleconferencing, videoconferencing, webinar, or skype), please describe. Yes. We will set up a webinar or Go-To session. Arrangements have been made to have this videotaped, as well.

2. Please describe how you prioritize the projects you work on in regards to documentation, staff development, and technical training.

a. Who participates?

Operations staff is the primary participants and recipients of SOP development and associated training. Training is done by the Process Control Specialist for all new SOPs and SOP modifications on a twice per month schedule.

b. What forms, survey, analysis, workshop, documentation, etc. are used to support the prioritization process? There is no formal process for this.

c. What criteria are used as a basis for prioritization of specific tasks or processes? (Check all that apply)

Employee Safety

Regulatory Compliance

High Volume

High Consequence of Failure and high impact

Other (please explain):

3. What demonstrated knowledge, skills and abilities do you look for when hiring new employees to do instructional design, development and delivery?

We do not hire for this. Everything is done in-house with existing staff, in addition to their regular duties.

4. What organizational rewards (e.g., job advancement opportunities) if any are provided to staff who receive technical and/or staff development training?

Occasional promotional opportunities are available. Participation in technical and developmental training and demonstrated application of skills acquired give these candidates extra credentials.

5. What type of culture change do you believe are necessary in order for training and staff development programs to support successful succession management? In your opinion, has your organization made strides toward implementing such changes, and if so, how? If your organization collects data which relates to advancement in this area, which data do you collect, and how do you measure your advancement?

L/E WWTP has opportunity to take advantage of City of Englewood Leadership programs and training. Strong encouragement from management for L/E staff to participate in these programs is given and the participation rate is the highest among all City departments. Documenting SOPs and encouraging staff participation in this process is the start of the program. Further work needs to be done to identify key knowledge holders and gain their participation before they retire. Also, a defined succession plan has yet to be developed.

6. Have you incorporated regulatory compliance procedures and documentation into your operating and maintenance work order system? Yes, but very limited.

7. What different formats for documentation, staff development, and training materials have you considered and used in your training programs? What have you found to be some of the pros and cons of different approaches?

Material	Considered <i>(check all that apply)</i>	Used <i>(check all that apply)</i>	Pros	Cons
Written SOPs		X	Consistent and safe application of regular tasks and processes. Reviewed annually	This is a fairly time consuming and lengthy process
Video SOPs		X	Considers a different learning style and provides visual validation of success Videos used within written SOPs	No room for craft discernment and abnormal operating conditions
Online training		X	Easy to access and use	Not facility specific
Video		X	Accessible and efficient. Can add	No way to evaluate effectiveness. No

			interest and appeal to the visual learners.	opportunity for interaction.
Interactive		X	Accounts for greater coverage of different situations employees may face. Allows for simulated decision making	No guarantee that information will be retained.
Tutorial		X	Not used too much. Easy, quick, efficient reminders rather than full blown class	Not very deep and does not take into account of different learning styles
Avatar	X			
Materials to be used in a classroom setting		X	Used on a very limited basis	
Powerpoint		X	Familiar format with some flexibility with presentation. Easy to put together quickly and provides visual.	Can be overused and boring.
Student guides	X			
Video		X	When done appropriately, adds an interesting element and can hold attention longer.	Boring and not interesting to watch alone. Learning can be limited without interaction.
Other (Please Explain)				
Simulations using computer technology	X			
Field guides		X	SOPs used in field. Easy to follow, step by step instructions for completing tasks. Can access electronically, if necessary.	
Scenario based training	X		Just beginning work on developing safety related scenario	

			based training	
Field Demonstrations	X			
Webinars		X	Convenient and productive	Difficult to measure effectiveness.
Skype	X			
Podcasts	X			
Videoconferencing	X			
Mentoring		X	Direct and individual one on one interaction. Best and most focused training.	Difficult to get employee buy in and participation. Difficult to implement enterprise wide. Risk of passing along process errors.

8. Please provide information for any training program or product produced in each applicable category where documentation/training materials have been produced.

Material	Sample product or program
Written SOPs	InfoNet – One stop shop for all L/E WWTP SOPs and plant information
Video SOPs	InfoNet
Online training	Available through rmwea.org/RMWEA
Video	
Interactive	Bi-monthly process training
Tutorial	Ops Challenge math tutorial
Avatar	
Materials to be used in a classroom setting	
PowerPoint	Process control training
Student Guides	
Video	Confined Space/Enclosed Space (Internally Developed)
Other (Please	

Explain)	
Simulations using computer technology	
Field guides	SOPs (Internally Developed)
Scenario based training	
Field Demonstrations	
Webinars	We primarily take advantage of webinars offered by others.
Skype	N/A
Podcasts	
Videoconferencing	Infrequent

Training/Staff Development Project Worksheet

Topic/purpose of training	Safety in work zones
Name or Title of Training Product(s) or Programs Produced	
Type of Products/Programs Produced	
Date(s) Produced	January - May 2010

For this product or set of products or programs, please describe the following (if it is feasible to provide a flowchart or time line, this would be extremely helpful).

1. The process used to create it (them):

The process used to develop InfoNet and write SOPs:

- Consultant developed electronic operations/maintenance manual for the Phase 2 project
- Consultant assistant to get knowledge management initiative started
- Knowledge management initiative core team assignment: Process Specialist, Lead Plant Operator, Data Analyst

- Knowledge Management Team: 2 plant operators, one senior, one new; 1 Operations Supervisor; KM core team.
- Establish process for developing SOPs, tracking hours associated with SOP development and reminders for annual SOP review. This is done in the asset management system, Infor EAM.

2. Professional services and/or contractual costs:

Consultant developed on-line manual: \$150,000. Annual support cost: \$5,000

Consultant assistance for KM initiative start-up: \$20,000

3. Estimated staff time (by job category):

Unknown at this time, as there was no tracking mechanism in place.

4. What issues did you run into that affected the amount of time it took to develop the product(s) or program(s), such as lack of specific skill sets, time allowed away from job to participate, etc.?

Time it took to get InfoNet set-up, developing the process for getting SOPs written and managed, lack of staff participation.

5. Any equipment and supplies that were required (including hardware/software):

Purchase of software and associated support agreement

Server space and back-up strategy

Cameras and video recorders

Snag-it (editing software)

6. Incentives used to encourage staff to develop staff training material:

None

7. Tracking system used to track costs associated with development of training tools:

Oracle for purchasing

Infor EAM for tracking staff time and SOP review assignments

8. Support required for implementation of the training tool (e.g., providing equipment in the field to provide staff access to information, or change in work schedules to allow training time)

Staff time: Process Control Specialist; Lead Operator (this person was taken out of his Operator role and assigned the role of SOP development coordinator.

9. What have you done to ensure that training products/programs are used? (Examples would be providing access to field staff through mobile computers, requiring supervisors to track staff use of training materials and verification of knowledge gained, tracking use through a Learning Management System, and scheduling formal training sessions using materials.)

Electronic access throughout the plant via wireless network using laptops, handheld devices and iPads.

10. How do you evaluate the success of your training product(s) or program?

There is no formal evaluation process

11. Lessons Learned:

Management support and organizational commitment to assign roles and responsibilities to this program are vital to its success.