

Operational SOPs: 1st Step in Retaining Workforce Knowledge & Experience

Paul Thompson

Over the next five years, the first of the “baby boomer” generation will be eligible for retirement. This will create an industry-wide void for qualified employees, and the priceless knowledge gained through experience may be lost.

The city of Pompano Beach is developing new programs to address this growing concern. One of the programs currently being implemented as a first step in retaining utility workforce knowledge is the production of standard operating procedures (SOPs) for plant operations. These SOPs include critical operational tasks such as equipment start-up, equipment shut-down, monitoring, and machinery maintenance.

Our daily procedures are the foundation of our water treatment operation. Preserving the best of these procedures, while adding enhancements, will not only improve our daily operations but also provide a key ingredient for the future success of our water treatment plant. The documentation of procedures through SOPs will lay the foundation for the next phases of retaining utility workforce knowledge: training, mentoring, document mapping, and interviewing.

To effectively retain workforce knowledge, management must believe in the importance of the program and demonstrate its commitment to this goal by allocating resources such as staff time and tools. A plan for the action items necessary to accomplish the goal should be in place. The first step is to document current basic knowledge through the use of SOPs.

Creating effective SOPs requires careful planning. A project committee with participants from all areas of operations may be assembled. The committee can determine the project schedule, how often the group will meet, and how much time will be dedicated to the tasks.

A team leader or facilitator will oversee the committee tasks and may do most of the writing, as well as perform most of the computer work. This person should have the necessary skills to accomplish these tasks or have someone else on the team with these skills. The team leader should also have a basic background in all phases of operations, including safety and maintenance.

To create effective SOPs, we began by reviewing traditional SOPs. Many operators

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dislike traditional SOPs because they are usually outdated, inaccurate, and missing critical information, while at the same time offering too much superfluous information.

Operators routinely refer to the technical manuals for missing critical information, wasting valuable time in searching for the material and then deciphering the sometimes highly technical language. Although the engineering drawings, preventive maintenance, instrumentation and controls, and other information found in operator manuals are all important, such information is better maintained separately.

Existing SOPs may have been created when a utility plant was built. These partially outdated documents can hinder effective training efforts and daily operations and may result in safety concerns. In selecting the new format for the SOPs, the main considerations were:

- ◆ Include only critical steps in the SOPs.
- ◆ Keep all SOPs in one document, but keep copies at many points of use.
- ◆ Keep wording and instructions simple and concise—user friendly.
- ◆ Use plenty of pictures showing actual equipment and parts.
- ◆ Use graphical displays to show process flows and location maps.
- ◆ Use a format to allow for quick and easy modifications.

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STANDARD OPERATING PROCEDURES MEMBRANE SYSTEM

START-UP

1. Select desired train to start from scada system.
2. If necessary, initiate pretreatment from scada system.
3. When pretreatment is satisfied, reset alarm and start desired train.
4. Make sure train is within normal operating ranges.

Make sure chemical, cartridge filters, and wellfield systems are operational before starting membrane trains.

Emergency stop train and notify operations supervisor immediately in the event of an uncontrollable situation.

SHUTDOWN

1. Stop membrane train on scada system.
2. Flush membrane with permeate water.

While flushing membrane train, do not allow cleaning tank to run dry.

If shutting down multiple trains, allow at least 15 minutes before stopping the next train.

MEMBRANE SKIDS 1-5

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**PLANT LOCATION
MEMBRANE AREA**

Operational SOPs

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- ◆ Include safety checks and requirements in the SOPs at point of use.

In order to accomplish these format requirements, we combined the information from 10 separate manuals into one set of SOPs. We identified the operations for which SOPs were required and wrote one at a time.

During the writing of each SOP, as many people as possible were interviewed to obtain the most efficient and acceptable way of performing the individual tasks for a given process. By involving staff in this critical step,

not only were variations in procedures identified, but the involvement encouraged staff to feel comfortable with the SOP process, as well as any future changes.

The steps were entered into a computer program (Microsoft Suite) along with pictures of the equipment and graphic location maps. Arrows pointing to specific knobs and switches lead to more detailed explanation boxes. The photos and graphics not only assist the user in visualizing the procedures, but also add "life" to the SOPs. Portions of the SOPs may be laminated and colorfully displayed alongside the particular piece of equipment or within the process area.

The new SOPs should be created to allow for frequent and easy modifications. Using computer programs allows for easy revisions. A documentation tracking program should be used to record different SOP revisions, and a records maintenance program should be implemented to keep outdated versions on hand for reference.

In order to facilitate employee access to the most current procedures, the SOPs will be placed at local computer stations within key sections of the plant. Networking the SOP manual will further allow the procedures to be updated quickly.

The most important step in finalizing the SOPs is verifying the procedures. Procedures should never be used until they are verified by the most knowledgeable, experienced staff and approved by the plant superintendent.

During this step, the SOPs are fine tuned, corrected, and enhanced. For this task, it is critical to include a good cross section of staff from the team. Special attention must be paid to all safety instructions, and the SOPs should be reviewed by risk management or utilities safety personnel.

Once approved by the experienced members of the staff, the SOPs should be tested on the newest members of the workforce to ensure that instructions are clear.

Generating SOPs is a vital step in retaining workforce knowledge. Experienced or retiring staff may then use these SOPs to conduct internal training.

Additional steps to retain workforce knowledge include mentoring programs, documentation mapping (identifying where critical historical documents are stored), and interviewing exiting staff to write historical utility narratives for future use.

Besides retaining workforce knowledge, SOPs become a daily tool outlining the correct procedures to be followed to ensure a high-quality product. The SOPs facilitate the training of new staff and reinforce safety requirements. Other benefits include:

- ◆ Reduced training time.
- ◆ Improved work consistency and quality.
- ◆ Promotion of a positive public image.
- ◆ Improved employee welfare and safety.

Predetermined operational standards and emphasis on safety in a new technological format reflect the vision for the future that many more-experienced employees have envisioned and less-experienced staff will help to implement. We can't afford to let that priceless knowledge and experience now held by our industry dissipate. It is the obligation of each water utility to preserve this knowledge and experience and to assure the public that we will continue to provide the safest, most efficient water treatment practices for years to come. ◊



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