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A paper presented at the Annual Conference on Jun. 6, 1972, by Bruce E. Regadanz (Active Member, AWWA), water production supt., Santa Clara County Flood Control and Water Dist. (Technical Service Member, AWWA), San Jose, Calif.

Since the day the first water was delivered through a hollowed-out log into a trough in the center of town, the water-supply industry has been on the move, improving services, facilities, and water quality. In the past few years there have been great strides forward in water-supply technology. Unfortunately, in many cases the training of operators who staff modern and sophisticated water-supply facilities has lagged far behind the advances made in both equipment and technique. This problem has forced the water-supply industry to embark on extensive programs to upgrade its employees' proficiency.

Training

The only way to achieve the levels of performance required today is through training; and the first and foremost problem in this case is motivation. The employees should be convinced that they want to be trained. This involves a selling job on the part of managers. Typically when thinking of improving performance, they think first of compensation, fringe benefits, and promotional opportunities. They too often neglect the importance of training and management's role in such a program. Training is often thought of as work for the front office, but even in a small organization, where some personnel responsibilities are centralized, there is little time allowed for even a part-time training coordinator; and in large agencies, with a full-time training coordinator or staff, job-skill training is negligible or nonexistent. Therefore, a great deal of the training responsibility falls on the water-system manager.

In terms of upgrading employee performance, one must assume that the operators under discussion have been trained in the basics of water-supply operation, and to varying degrees are journeymen-level operators. Management's concern is to train these people to accept and make use of the more sophisticated equipment, chemicals, and techniques available today. This can often be a problem as most people tend to resist change to some degree. As an example of this, a plant was visited just a few months ago that used a conventional alum, lime,
registers is included. In addition, the trainees accompany
found in some "old hand"-type operators, that must
utility that is building its first water-treatment plant is
of measuring the progress of the new readers. The estab
lished standard is seven allowable errors per month for
per month, with the lowest averaging 0.3 of 1 error
per month up to a high of 5.8 errors per month.
More than 1.8 million meters were read last year with
overall responsibilities of the job, the importance of pub
ishing in the various types of meters used throughout the
system, the mechanics of the meters, and the types of
registers is included. In addition, the trainees accompany
qualified readers on their routes in order to become
familiar with the locations of meters in various areas of
the city. In San Antonio all of the meters are located in
the ground, either in alleys or on easements adjacent to
the streets. Therefore, one of the more difficult problems
faced by new meter readers is to find the meters, which
are frequently hidden by shrubbery, lawns, or other
obstacles. In the older areas of the city, they may be
almost anywhere. The lead meter reader evaluates the
progress of the new meter reader and can repeat por
tions of the training as required. Once the training peri
od is complete, the new meter reader is well equipped to
read meter routes without assistance.

The board's meter-reading activity has also estab
lished excellent standards against which to measure the
progress of all of the meter readers. This eval
uation is based on the number of errors in the readings
each month. The supervisor maintains detailed cumula
itive records of the number of errors and reviews this
information monthly with all the employees.

This type of performance standard is a valid method
of measuring the progress of the new readers. The estab
lished standard is seven allowable errors per month for
a completely trained reader. However, the experienced
meter readers average far fewer errors. During all of
1971 the top thirteen meter readers averaged 2.3 errors
per month, with the lowest averaging 0.3 of 1 error
per month up to a high of 5.8 errors per month.
More than 1.8 million meters were read last year with
less than 3,000 reading errors.

With this standard to measure performance
and chlorine process to treat a very stable lake water
with little turbidity. The quantity of alum being used was
sufficient to make one inquire as to whether or not the
use of polyelectrolytes had been explored. The operator
said the plant had run tests with several and found one or
two that did a very good job at considerably less ex
pense. When asked why the plant hadn't switched, the
operator reported that his boss said that since the plant
had been doing all right on alum for a good many years,
he could see no reason to change. It is this attitude,
found in some "old hand"-type operators, that must
change if management is to keep up with the times.

Effective Program

To be effective, a training program must be geared to
fulfill the needs of the utility involved. Sending operators
to other facilities to observe is a good idea and is usually
beneficial, but one must be sure that there is a specific
connection to training needs. The training must be done
for a specific plant and for the benefit of the personnel.
Individual utility circumstances will dictate the type of
training programs that are required. For instance, the
utility that is building its first water-treatment plant is
sometimes faced with a seemingly insurmountable prob
lem of recruiting qualified operating and maintenance
personnel. Therefore, due to economic considerations,
operators with a performance level less than desirable
might be recruited and then trained on the job. The
utility that is expanding or upgrading an existing plant
can also have a serious problem depending on the age of
the original plant and the degree of sophistication de
signed into the addition.

Training Goals

One approach to setting up a training program as a
means of improving performance is an examination of
expected gains. Some goals are

1. Reduction in the time required for full journey
man-level performance by new employees, plus the abil
ity to adapt quickly to changing equipment and proc
esses by long-term employees.
2. Reduction of accidents, errors, equipment, and
process malfunctions.
3. An increase in productivity through improving the
employees' ability to do their own job and the ability to
perform jobs of others as needs arise.
4. Improved motivation, because a fully-qualified em
ployee is more content on the job—the result being less
absenteeism, lower turnover, and so forth.

Conclusion

The high level of employee performance at the City
Water Board is attributable to many things. To maintain
or to improve the level of performance on a continual
basis requires the active support of management and the
daily interest of the supervisors and the employees. No
one specific program or group of programs will provide
miraculous results overnight. Progress is generally slow,
but the values received are worth concerted effort.

It is important to each employee that management
establish an environment that is conducive to a high
level of performance. The individual employee needs to
be supported in his daily work activities by the proper
tools, equipment, vehicles, and facilities. An employee
who can take pride in his surroundings and equipment is
more apt to take pride in the level of work he accom
plishes. The board's management has provided such an
environment. Additionally, it has consistently supported
a salary-administration program that permits appropriate
recognition of an employee's excellence of performance.
Recognition of good performance and long service is
encouraged through salary increases and service-awards
programs. When an individual employee improves his
qualifications, he has the opportunity to progress to
greater responsibility. Employees who are supported by
management and their supervisors will, in turn, support
the organization by a high level of performance.

JANUARY 1973
B. E. REGADANZ 55
5. An employee who is technically competent will often set the pace for others not at his level of proficiency.

6. Training can provide a pool of people qualified for advancement when a higher-level vacancy develops.

Areas of Training

After the training goals are established, management must decide what kind of training is needed. Certainly there is no need to spend the time, money, and effort to train people in areas in which they need not be knowledgeable. On the other hand, a training program that is not thorough and just skims some important aspects of the subject is worse than no training program at all.

Training needs may be determined by the following:

1. Management and supervisory personnel should plan together and discuss in depth the problem areas that will be encountered.
2. If new facilities are involved the engineering consultant should be invited to participate in these meetings.
3. Let the men become involved; management should sit down with them and get their ideas. No one knows better then they do their own areas of deficiency.

Type of Program

With training goals established and training needs determined, the next problem is choosing the type of training. There are several considerations. The motivation of the employees can wither and die unless management is very careful about how the program is started and continued. The best means of providing training and the frequency of sessions must be determined. This is an excellent time to get the men involved—they will feel a part of the program and certainly will take more of an interest in it, with a much better chance of gaining the benefits management is trying to achieve. The training sessions should be best suited to management's needs and receptive to the personnel. Some suggestions are

1. Group training (formal classes, in-house or at some other facility)
2. On the job training
3. Self study with a prepared text or a correspondence course
4. Informal meetings, such as safety-type tailgate sessions

Instructor

Regardless of the type of training sessions that is ultimately used, there are some pitfalls of which to be beware. Most important is the selection of an instructor, discussion leader, or whatever the person conducting the lesson is to be called. He must be able to talk on the level of the people he is trying to instruct. A common error is the idea that the more learned the instructor, the better the learning potential of the class. The pupils will lose interest if they are forced to listen to someone who talks in terms they cannot understand. A good instructor need not be an accomplished teacher, but he should be able to communicate with the people in the class and develop a rapport with them; he should encourage questions and discussion; he should always convey to the class his desire to help them and discourage the feeling that it is a chore to attend the sessions. A good idea is the use of different instructors for different subjects by finding specialists for chemistry, bacteriology, electricity, or hydraulics. Managers must shop around for instructors and find people who have done this sort of thing before so they can get a feel about how these instructors are received by a group. Many people know the subject matter well, but what is needed is someone who can communicate.

The timing of training sessions is also important. They should be long enough for meaningful study, but not tiresome. The sessions should have a break in the middle to let people stretch their legs and move around a bit. Another suggestion is paying people for training sessions not conducted during regular working hours. The idea of having training sessions after dinner is good because they do not interrupt the workday routine. The fact that the men are paid for this time indicates to them the company's interest in the training program. A few dollars spent in such a manner can do wonders for employee morale and interest.

Another good source of training is the equipment supplier. Many offer courses either at their factories, water-supply facilities, or some central location. Courses at the factory will cost management a few dollars, but this is more than repaid in the higher level of plant-equipment accuracy and security received in return. Chemical suppliers will talk to people regarding the use of chemicals. These suppliers can be very helpful, particularly in the areas regarding polyelectrolytes.

The AWWA courses, such as Operator Workshops, are excellent. Reports from attending personnel have been highly favorable. The section education committees may provide training courses that would be of help to personnel. If they do not, management should contact them and get something going.

Local adult-educational programs should be watched for courses of interest and possible application to a particular situation. Some educational institutions will put on a special course if a guaranteed attendance can be predicted.

Monitoring Results

Often after a training course has been completed, everyone involved relaxes, congratulates each other, and looks forward to the old daily routine; management may feel that the people have received high-level training, and now all operational problems should be solved. This frame of mind could cause the entire effort invested in the training program to be wasted. The big job at this point is to monitor the results of this training to make absolutely sure that the new ideas and methods are being put into practice.

Summary

There is little controversy over the significance of employee performance in the efficient operation and management of water-utility facilities. There are few managers unconcerned with the improvement of employees' performance as a means of making their own job easier and improving their own effectiveness.

If this is true, then in the interest of efficiency alone, management should pursue vigorously the training programs required to bring all water-utility personnel to the high performance level demanded by today's technology.