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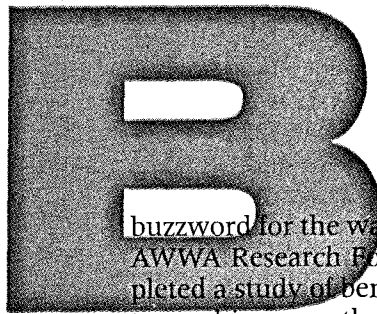
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Metric benchmarking

Benchmarking is becoming a popular tool for utilities to systematically assess how their performance compares with that of other utilities, so that trouble spots can be targeted.

**Linda Blankenship,
Myron Olstein, and Barry Liner**



Benchmarking has become a buzzword for the water industry in recent years. The AWWA Research Foundation (AWWARF) has completed a study of benchmarking for the water industry and is currently sponsoring an effort to expand

WaterStats into a database that can support benchmarking efforts. In the past few years, individual utilities have performed benchmarking studies, and a number of self-formed benchmarking groups around the United States are currently active and producing results.

Why has benchmarking become so widespread, when as recently as 1994, virtually no benchmark-

In recent years, benchmarking has gone from a buzzword in the water industry to a useful tool to assess performance. The AWWA Research Foundation has funded two studies of benchmarking, is sponsoring expansion of WaterStats into a database that can support benchmarking efforts, and has defined two forms of benchmarking—metric benchmarking and process benchmarking. Metric benchmarking, more commonly used by water suppliers, involves tracking operations over time and comparing the performance against that of similar companies within one industry. Process benchmarking breaks system processes into individual steps and then compares these process elements with those of the best practice providers from any field. For water utilities, benchmarking is particularly useful in five distinct applications: management review, strategic planning, outsourcing of services, reports to management, and system acquisition.

For executive summary, see page 171.

ing efforts were under way? More important, how is benchmarking accomplished, and is it just another management fad that in time will fade away?

Benchmarking defined

What is benchmarking, anyway? Robert Camp, the author of the seminal text on benchmarking,¹ defines it as ". . . the systematic process of searching for best practices, innovative ideas, and highly effective operating procedures that lead to superior performance of one's own organization." The authors like Marion Harmon's definition of benchmarking: "the practice of being hum-

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etric benchmarking is defined as a quantitative comparative assessment that enables utilities to track internal performance over time and to compare this performance against that of similar utilities.

ble enough to admit someone is better at something and being wise enough to learn to match and even surpass them at it."² This definition captures the spirit of excellence that is at the heart of benchmarking.

The AWWARF study Performance Benchmarking for Water Utilities³ identified two distinct and separate procedures referred to as "metric benchmarking" and "process benchmarking."

- Metric benchmarking is defined as a quantitative comparative assessment that enables utilities to track internal performance over time and to compare this performance with that of similar utilities. A utility can identify the areas in which it performs relatively well compared with other utilities, as well as the areas in which its performance needs to be improved. This comparison process can help the utility establish target levels of performance.

- Process benchmarking uses step-by-step "process mapping" to break down processes into specific work procedures. Then each of these process elements is compared with "best practice providers," those companies considered excellent at this particular process. Processes that fall short are targeted for improvement. This type of benchmarking is known as Xerox-style benchmarking after work undertaken in the Xerox Corporation from 1979 onward.³

Both types of benchmarking are being performed by water utilities, but metric benchmarking is by far the most common.

Performance Benchmarking for Water Utilities also defined an eight-step approach to metric benchmarking (shown in the sidebar on page 60). Metric benchmarking and process benchmarking can be undertaken either as a package or independently using the eight-step process.

Why benchmarking and why now?

The water utility industry is going through a period of transformation. For many years, the industry's primary concerns have been to ensure that there was sufficient capacity to provide drinking water when it was needed and that the water met regulations. In the process of making sure that capacity, redundancy, and treatment were in place, certain aspects of utility management became secondary concerns. Today's customers, managing boards, and regulators, however, are demanding more cost-efficient operations and improved customer service.

Why this sudden change?

Demands driven by technological advances, other developments. There are five major reasons why the water industry is being asked to supply more than safe drinking water.

(1) Other service industries have significantly improved customer service levels. Customers now expect Nordstrom-like service.

(2) About 85 percent of all large water utilities (those serving more than 100,000 people) are government-owned, and governmental operations in general are under increasing pressure to control and even reduce costs and rates.

(3) Improved equipment and procedures now make possible reliable unattended operations during certain time periods. Customer service-related equipment such as automatic call directors has also improved tremendously during the past few years.

(4) Possibly the single most important reason is the entry of serious competition in the form of contract operators. In 1992, it was estimated that there were 200 contract-operated water and wastewater plants in the United States. A recent survey⁴ found more than 900 contract-operated plants, and that number is growing rapidly. In addition, bigger systems are becoming privatized.

(5) Utilities able to simultaneously reduce costs and improve customer satisfaction have had highly publicized success stories.

In conducting the case studies for this article, the authors met with more than one utility manager who had successfully reduced costs and improved operations and who claimed it was not extraordinarily difficult. When asked why they hadn't done it before, the answer was invariably that it had not been their number-one priority.

Some 15 to 20 years ago, American industry found itself in the same position that water utilities face today. After having markets to themselves, US companies were faced with competition from overseas. Not only did these new competitors provide services or products for less; they also offered better service.

Xerox copies the best. The experience of Xerox Corporation is the success story that spurred many



Performance measures are most effective when they are linked to program goals and objectives, are limited in number, and reflect management priorities.

If it's so great, why isn't everybody doing it?

Barriers inhibit benchmarking. As with anything new, it's not always easy to get started with benchmarking activities. Performance Benchmarking for Water Utilities³ surveyed a large number of utilities and identified five major barriers to benchmarking: (1) unreliability of reported operations data; (2) difficulty in obtaining comparable financial data; (3) lack of consensus regarding best practice; (4) wide differences among utility size,

companies to use benchmarking techniques. When Xerox found that its competition was able to sell photocopiers for less than Xerox could manufacture them, the company benchmarked every aspect of its process.

To improve its own process of selling photocopiers, Xerox benchmarked the warehouse distribution process of L.L. Bean, the research and development process used by Hewlett Packard, and the bill collection techniques used by American Express. None of these companies was in the business of making and selling photocopiers, but the individual processes were comparable. The adaptation of these "best in class" practices of the benchmark partners allowed Xerox to not only avoid bankruptcy but prosper and win the Malcolm Baldrige National Quality Award in 1989.

Is benchmarking just another management fad? Not to the companies like GE, Xerox, and Hewlett Packard that met the challenge 15 years ago and continue to benchmark actively today. Not to the US Department of Commerce, which uses benchmark criteria in bestowing the Malcolm Baldrige Award. Not to business magazines like *Forbes* and *Fortune* that more than 10 years after the methodology was developed continue to discuss the value of benchmarking in such articles as "Are You as Good as You Think You Are?"⁵

operations, management practices, and other areas; and (5) the perception that benchmarking was too time-consuming.

Benchmarking is not inherently difficult, but it is a resource-intensive activity. This is partly because comparisons between water utilities often must adjust for the many different accounting and other data-collecting methodologies in use. Typically, two adjustments are required: use of an activity-based costing process

The adaptation of these "best in class" practices of the benchmark partners allowed Xerox to not only avoid bankruptcy but prosper.

that attributes all direct costs, internal charges, program overheads, and even corporate overheads and use of a model to account for different explanatory factors between utilities. Explanatory factors are those items outside the control of management in the intermediate term. Therefore, they would need to be deliberately considered in any comparison (such as quantity of water produced or basic wage factor differences). For this reason, many utilities choose to focus on adapting best practices and develop their own internal performance measures to track progress over time.³

Many of these obstacles to benchmarking in the water industry are being dealt with by researchers or will be resolved through external events. For example, an increasing number of governments are producing Service Efforts and Accomplishment (SEA) reports. The Governmental Accounting Standards Board (GASB) has issued a research report on this topic—Service Efforts and Accomplishments Reporting: Its Time Has Come.⁶

SEA reports typically consist of input, output, efficiency and effectiveness measures, and utility statistics. GASB and groups such as the International City Managers Association are encouraging the publication of SEA reports by governments, and pressure from Wall Street is expected to make the reports a de facto requirement for utilities interested in obtaining financing. Therefore, the number of government entities with an interest in benchmarking is expected to increase.

Management uses benchmarking for specific tasks

Performance consists of two elements—results and practices. Results are the numbers posted by the operation, e.g., dollars per thousand gallons. Practices are the procedures, strategies, and tactics carried out by the organization. It is possible in the short term to achieve outstanding results without best practices in place; this scenario can happen when a charismatic leader carries an organization along on the strength of personal merits and qualities. In the long run, however, outstanding practices are necessary to achieve outstanding results.

Metric benchmarking facilitates certain functions. The authors have used metric benchmarking in specific situations and for certain processes to create an overall framework for improving efficiency and effectiveness. The top five management applications for metric benchmarking are management review, strategic planning, outsourcing, reports to senior management and decision-makers, and acquisition.

Management reviews use benchmarking to assess performance. Because of ever-increasing regulatory demands and the continual process of maintaining infrastructure, many utilities face large capital improvement programs. Large programs of this type typically mean bond issues, rate hikes, or both. In this era of public demand for government efficiency, customers want to know that their utility is effectively managed before the utility enacts a rate hike. Management audits or reviews offer a

Eight-Step Benchmarking Process

1. Select process or function for benchmarking.
2. Define how to measure performance.
3. Define explanatory factors.
4. Define data requirements.
5. Select comparison organizations.
6. Collect data.
7. Analyze data and present findings.
8. Initiate performance improvement program (process benchmarking).

way to assess a utility's focus and performance.

Public utility commissions have long mandated management audits for regulated utilities to ensure they are operating efficiently. City councils request that utilities perform management audits for the same reason. State environmental agencies may ask a utility to perform a management review before granting withdrawal or discharge permits. Whatever the reason for conducting a management review, bench-

marking can be used to determine whether the utility is performing satisfactorily.

In a recent management review required by state law, a combined utility investigated its water, wastewater, and electric operations. The review looked into the utility's goals and objectives as well as its general management. Much of the review was subjective and relied on skilled management consultants. Metric benchmarking was used to add more detailed quantitative analysis to support the consultants' conclusions. For example, a subjective idea—employee morale—was assessed by using specific measures of performance such as staff turnover, sick day usage, lost time because of injury, and number of grievances filed.

Using metric benchmarking provided quantitative support for the utility's audit; the process not only identified strengths but also pinpointed opportunities for improvement.

Benchmarking aids strategic planning. Most strategic plans include an internal analysis as part of the preparation process. The internal analysis is designed to identify and prioritize strengths and opportunities for improvement, particularly in management areas.

The authors benchmarked one utility to compare and verify the results they obtained from interviews with utility staff and facility walkthroughs. The following areas were benchmarked:

- Water system—distribution system operations and maintenance costs, average age of distribution system, treatment system operation and maintenance costs, number of permit violations, ratio of preventive maintenance to total maintenance, average number of main breaks, and level of unaccounted-for water.
- Wastewater system—collection system operations and maintenance costs, average age of collection system, treatment system operation and maintenance costs, number of permit violations, ratio of preventive maintenance to total maintenance, and average number of sewer collapses.
- Customer service—level of awareness, quality of service, reliability of service, cost control, and

community involvement (with all data based on a customer service survey, average length of service telephone call, average customer accounting costs, and hours of operation).

- Financial management—debt rating (insured versus uninsured), frequency of rate adjustment, debt-to-equity ratio, cash flow coverage, level of reserves, and completion of capital improvement programs versus budget.

- Management issues—number of organizational layers, level of employee communication, training dollars per person, and small purchases procurement limit.

- Employee morale—recent history of employee turnover, recent history of lost-time accidents, number of employee recognition programs, and utility culture determined through use of a propriety survey.

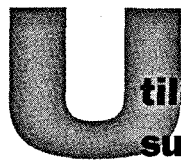
The results of the benchmarking exercise were used to raise management awareness of the utility's relative strengths and weaknesses. Using this information, management was able to determine which areas should be targeted for improvement by the strategic plan so that the utility could achieve its overall vision.

Benchmarking also provided the basis for establishing key performance measures for management to monitor on an ongoing basis as the strategic plan was implemented. Approximately 25 performance measures were established—five to seven in each of the five goal areas.

Utilities must avoid the temptation, however, to overdo the number of measures that are monitored. The measures monitored need to be limited to key performance elements, and they should reflect the operational aspects that are considered management priorities. Management should monitor only those measures that are essential to internal and external decision-making.

Outsourcing taps expert resources. In the interest of improving overall efficiency and effectiveness, many utilities are opting to "stick to their knitting." In other words, they are choosing to do what they do best by focusing on core operations—the actual running of the water treatment plant and water distribution system. These utilities are outsourcing non-core functions such as billing, landscaping, janitorial service, and even certain maintenance activities to alternative providers of these services. Some utilities have even decided to outsource core functions as well as more peripheral ones. Benchmarking is helpful in the outsourcing process because a utility can use benchmarking to first ascertain which functions to outsource and later on determine whether the utility is receiving satisfactory service from the outside provider over the life of the contract.

For example, in a recent outsourcing contract for the five-year operation of several wastewater plants the system was first benchmarked. The primary stage of benchmarking determined what other utilities with similarly sized plants with similar treatment technologies were paying to contract operators. This effort served three purposes. First, it identified the perfor-



Utilities are outsourcing noncore functions such as billing, landscaping, janitorial service, and even certain maintenance activities to alternative providers of these services.

mance gap between the utility's current performance and the cost level achieved by a typical private-sector contract operator, justifying the decision to outsource. Second, the utility became more knowledgeable about the cost level of the anticipated bids. Third, the effort identified relevant performance parameters for the service agreement.

When contracting for services, a utility usually develops a detailed agreement with the provider. The successful agreement includes desired results with specified performance measures. The benchmarking process allows the utility to identify which key performance measures (and their associated target values) the operator must meet. These performance measures should be included in the contract to ensure desired service levels.

Service providers often have a standard contract that offers performance measures that the utility must meet to maintain the cost levels in the bid. If the performance measures are not met by the utility, the contractor could then charge additional fees on top of the base contract price. An example of a common measure is specification influent (the quantity and quality of the water as it enters the plant). If a utility provides water outside the limits of specification influent, the contractor can add a penalty to the bill.

A system owner can use benchmarking processes such as performance measures for tracking the quality of any system function. For example, a wastewater system that contracts out the final processing, hauling, and land application of its biosolids defined performance parameters to assist in renegotiating the contract and specifying the service agreement.

Benchmarking helps information rise to the top. A few utilities do an excellent job of tracking performance measures on an ongoing basis. They regularly collect and report on key performance measures for the utility. The reports help the utility's senior managers and decision-makers ensure that day-to-day

operations are on track and that trouble spots can be eliminated before a crisis develops.

These reporting efforts may not always involve comparison with other utilities but rather compare like units (e.g., water treatment plants, water distribution system repair crews) over time. Such comparisons are important in identifying trends and alerting management to take appropriate action.

Benchmarking is not inherently difficult, but it is a resource-intensive activity.

For utilities lacking a system for the various departments and operational areas to regularly report to management, benchmarking offers a way to institute such a system. Benchmarking can be a tool to (1) obtain specific data about a utility's performance in comparison with other utilities and (2) get this information into the hands of management on a regular basis.

Acquisition a good time to benchmark. A city water and sewer department was recently acquired by a municipal electric authority. As part of the review of the acquisition, senior management wanted to have a better understanding of the efficiency of the system they were acquiring.

A high-level strategic review was conducted, and the water and sewer systems were benchmarked in the following key areas:

- water distribution system operation and maintenance costs,
- water treatment costs and staffing,
- water treatment permit violations,
- wastewater collection system operation and maintenance costs,
- wastewater treatment costs and staffing,
- wastewater treatment permit violations,
- financial benchmarks including return on investment, current ratio, debt-to-equity ratio, operating ratio, and cash flow coverage,⁷ and
- number of organizational layers.

The benchmarking review developed benchmarks from a proprietary database of financial and operating data on more than 200 water utilities. As a result of this review, the new management team was able to identify priority areas for the reorganized utility to focus on.

Conclusions

Benchmarking is becoming an important tool within the water industry as a way to assess utility operations and compare performance with that of other utilities. The AWWARF study Performance

Benchmarking for Water Utilities defined two separate procedures, metric benchmarking and process benchmarking. Both of these forms of benchmarking use an eight-step process involving planning, analysis, integration, action, and maturity.

Metric benchmarking is more commonly used within the water industry. The authors have found metric benchmarking used with performance measures to be a useful tool in managing utilities and ensuring that goals and objectives are met. Above all, performance measures are most effective when they are linked to program goals and objectives, limited to those measures that cover key performance elements, and reflective of management priorities.

There are five areas in which benchmarking is proving its worth: management review, strategic planning, outsourcing, reports to management, and system acquisition. In each of these areas, benchmarking offers a systematic way to assess performance and compare it with other industry standards so that necessary improvements can be made.

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