

# **CHARLESTON COMMISSIONERS OF PUBLIC WORKS CONDUCTING A TWO FRONT WAR TO ACHIEVE CONTINUAL IMPROVEMENT**

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## **ABSTRACT**

The year 1998 signaled change for the Charleston (S.C.) Commissioners of Public Works (CPW): three changes in the top four officer position with CPW's fourth new General Manager in the last 80 years; competitiveness as a major issue as CPW had some of the highest wastewater rates in the country; and major succession issues had to be confronted with a number of senior personnel approaching retirement.

CPW needed to change and the change needed was more than a superficial change that typically accompanies a new General Manager. CPW needed a cultural change to become more competitive and to strategically plan for personnel changes that would accompany the impending retirements. Most importantly, it needed to define a vision and implementation scheme for 2005, the time frame CPW's Board of Directors gave to implement these essential changes.

As executive management looked at the various improvement programs that were available – such as Qualserve, Partnership For Safe Water, and others – it felt that although these were useful tools, they would not yield the two things needed most:

- An overarching direction
- A program for Continual Improvement

Executive management also believed that, whatever road was taken, that it should involve every associate in the utility. Every associate of CPW would need to know what the utility was collectively doing, and to help define where it was going. It was critical to avoid the “program of the week” syndrome – everyone needed to know that getting better was not a one-time occurrence, but that which occurred all-the-time.

As the needs of CPW were assessed, it was determined that two major efforts would be pursued; namely:

- A Strategic Planning Process; and

- Achieving utility-wide registration of an Environmental Management System (EMS)

It was understood that it would be an extraordinary effort to do both simultaneously; in fact, no water or wastewater utility at the time had ever achieved utility certification of their EMS. Nonetheless, both efforts were seen as critical for the strategic plan to give CPW our overarching direction, and the EMS to reflect CPW's commitment to environmental responsibility and to provide the utility with a framework for continual improvement.

## **DESCRIPTION OF FACILITIES**

The Commissioners of Public Works (CPW) has been an essential part of the Charleston community since 1917. Water and wastewater service is an important regional economic development enabler. In addition to serving the City of Charleston, CPW currently supplies water to portions of Berkeley, Charleston, and Dorchester counties. Wastewater treatment is provided within the City of Charleston and the St. Andrews Public Service District (now owned by CPW). Treatment is also provided to the James Island Public Service District and the towns of Folly Beach and Hollywood.

The following are some key statistics regarding CPW:

- 118 mgd conventional water treatment plant
- 1500 miles of distribution mains
- 36 mgd and 0.5 mgd tertiary wastewater treatment plants
- 450 miles of collection system
- 400 full time associates

## **THE STRATEGIC PLANNING PROCESS**

CPW selected Black & Veatch, Inc. to provide strategic planning assistance. Exhibit I, is an overview of the strategic planning approach.

As one moves from left to right on the above chart, one moves from why things are to be done to how they will be done.

### **Utility Wide Involvement**

The strategic planning effort started out with a core management group of 12-15 associates to begin the process of defining mission, values, and goals. Once the preliminary goal areas were defined, the planning group was expanded to some 20+ people to include goal team members. During the strategic planning process, meetings were conducted with employee groups at various utility locations to allow for involvement in the process of nearly every CPW associate. As part of the process of meeting with all associates, surveys were administered to see if there were significant differences in the way different levels in the organization viewed where CPW was and what direction it needed to take.

## **Identification of Goal Areas**

A wide range of approaches were utilized to identify goal areas and specific improvement targets:

- Early in the process, the utility was benchmarked. The purpose of the benchmarking was to identify “gaps” between where CPW was and where management wanted it to be; also, the benchmarking identified key performance metrics that would be established later in the process by the goal teams. After the initial strategic planning effort, there was a desire to be able to quantitatively track progress in meeting strategic goals (“you only manage what you can measure”).
- A SWOT (strengths-weaknesses-opportunities and threats) analysis was performed. This analysis was combined with the results of other analyses to make sure that investments were not being made in areas already strong (supported by the benchmarking analysis), nor that investments were not being made in areas of relatively low importance (either to stakeholders or based on the environmental scan discussed below).
- A stakeholder analysis was performed. Interviews were conducted with elected officials, Board members, customer advocates, representatives of the media, regulators, the professionals that CPW worked with and others. Associates of CPW were also considered to be stakeholders. Resources devoted to improvement could therefore occur in areas that were important to stakeholders.
- Finally, an environmental scan was completed. The structure of that scan is shown in Exhibit I. This 35-element analysis helped to identify the future that CPW would likely be operating in. A series of exercises were performed to identify the seven to ten elements of most-likely importance to CPW.

The above steps were performed over four workshops and in meetings with employees. At the end of that process, a mission and vision statement was developed along with six goals and supporting strategies to achieve each of these goals. Specific performance measures were identified to aid in accomplishing the strategies and determining their effectiveness.

## **CPW’S GOALS**

CPW’s strategic plan through 2005 consisted of six goals:

- Operations

Utilize effective and efficient work practices to improve performance and control rates by optimizing the cost of operations.

- Information Technology

Optimize the use of cost-effective automation and information technology.

- Workforce

Develop a flexible, right-sized organization that is knowledgeable, productive, and committed.

- Customer Service

Provide a level of service that is cost-effective and that the customer perceives as high in quality and value.

- Economic Development

Strategically deploy our assets to enhance regional long-term economic development while insuring environmental protection.

- Administrative Support

Utilize effective and efficient work practices to improve performance and control rates by optimizing the cost of administrative support.

## **Forming Goal Teams**

Once the six goal areas were selected, goal teams were formed. The teams contained a mix of senior personnel (to provide sponsors for the plans to be developed by the goal teams) and junior personnel (to assist with Plan buy-in). The teams held meetings over a period of three months to identify strategies, performance measures (including target performance measures) and specific plans to achieve goals.

Before the individual goal teams' efforts were finalized, a workshop was conducted to make sure:

- That the plans were in alignment (some goal teams had produced plans that would affect the efforts of other goal teams).
- That the plans, taken as a whole, were affordable and capable of being implemented. An important consideration throughout strategic planning is to optimize the use of resources (both dollars and hours). This last review was necessary to make sure the goals were realistically attainable.

The Goal Team Statement and supporting Strategies and Action Plans were developed for each Goal. The following example is given for the Goal of Operations:

## Operations

Utilize effective and efficient work practices to improve performance and control rates by optimizing the cost of operations.

The key strategies and actions for achieving CPW's operations goal are:

1. Maintain infrastructure in order to maximize useful life
  - Develop database for tracking equipment and infrastructure replacement
  - Optimize maintenance activities through the effective use of CMMS
  - Select and implement predictive maintenance technology
  - Establish planned maintenance program for equipment and infrastructure
  - Establish schedule for equipment and infrastructure replacement
  - Evaluate logic-based (neural network) software to prioritize and schedule maintenance and PM tasks
2. Reduce staffing levels through attrition and reassignment of duties
  - Evaluate each job vacancy to decide need to fill
  - Collect and evaluate benchmark staffing data from similar sized utilities for each department
  - Develop staffing plans for each department
  - Establish departmental productivity management plans
  - Evaluate combining sections and/or departments to reduce overlap of tasks and form a flatter organization
  - Investigate use of automation to eliminate redundancy of personnel tasks
  - Re-engineer sections and/or departments
  - Evaluate whether to combine maintenance, instrumental/electrical, and process control staffs to streamline plant operations
3. Reduce utilities, chemicals, materials, and supplies expenses
  - Investigate, select, and implement power management software
  - Evaluate use of SCADA system for better monitoring and feedback of chemical feed systems
  - Identify equipment systems appropriate for applying customer and supplies alliances for materials procurement
  - Establish an effective inventory system in each department
  - Select and implement software to manage company-wide inventory
  - Evaluate having developers install water service lines and meters
4. Achieve and maintain ISO 14001 certification
  - Develop and implement EMS

## **DEVELOPING AND IMPLEMENTING AN EMS**

In a recent work group sponsored by WEF, AMSA, and EPA, it was concluded that an EMS was an excellent vehicle on which to develop continual improvement while allowing additional improvement programs specific to a particular area to be added. Such specific-area improvement programs might include the Partnership for Safe Drinking Water and QualServe. A well-designed EMS, such as ISO 14001, allows a utility to provide a framework for continual improvement while integrating improved environmental performance with the business or strategic plan of the utility. Describing the details of an EMS are beyond the scope of this paper, but the benefits of implementing an EMS, as well as the general procedure used by CPW, will be discussed.

### **Benefits of an EMS**

The benefit of implementing an EMS, especially when integrated into an effective strategic plan, are very comprehensive. The first benefit would be improved environmental performance. This could be manifested as more consistent compliance with regulatory standards, reduction in risk and liability from chemical spills, and better operational and maintenance controls. For example, CPW has seen an improvement in its maintenance ratio of seventy percent (70%) preventive to thirty percent (30%) corrective maintenance.

This has led to improved asset management, documentation of needed capital improvements and systematic preventive and predictive maintenance of all water and wastewater facilities.

Second, there should be a heightened awareness of all associates of the need to protect the environment and public health, which should produce greater incentives for individual performance excellence and the beginnings of a change in work culture. Greater levels of training should produce more competent associates and a more competitive workforce in an age of competition. For example, CPW has developed a detailed training matrix for each position within the utility.

Third, there should be a reduction in waste and energy use. CPW currently recycles all oils and lubricants, anti-freeze, and paper stock. Energy use has been reduced through power management software and a reduction in vehicular fuel usage.

Fourth, operations should be optimized to produce the highest quality effluent and finished water. This leads to greater protection of public health and a potentially better public image of the utility. While other benefits could be included as this list is by no means comprehensive, it does illustrate the comprehensive nature of the continual improvement element of an EMS.

## Implementation of an EMS

Implementation strategies will differ from utility to utility, but CPW took the approach of implementing an EMS or a pilot level and obtaining registration of a major functional area (Water Distribution in 1999), then expanding this effort by additional functional areas to include Water Treatment and Lab, Wastewater Collection, Fleet Services, Wastewater Treatment, Design and Construction and Administrative Services. As each functional area went through the registration process, improvements were made in the EMS and implemented accordingly. Therefore, implementation and improvement of the EMS was done using an iterative approach, with an EMS team leading the effort in each functional area. This has yielded extensive associate involvement and the development of many associates with a comprehensive understanding of an EMS.

## SUMMARY

Implementing a Strategic Plan and a utility wide EMS was not easy. CPW became the first utility with utility-wide EMS registration under ISO 14001.

Today, CPW has a robust strategic planning process. A recent review of the original Plan validated that CPW is on-track to achieving each of its major goals. And, with a mature EMS, CPW can concentrate on continual environmental, customer service, and financial improvements.

Exhibit I

