

Water Sector Workforce Sustainability Initiative

 Subject Area: Management and Customer Relations



Water Sector Workforce Sustainability Initiative



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The Water Research Foundation (formerly Awwa Research Foundation or AwwaRF) is a member-supported, international, 501(c)3 nonprofit organization that sponsors research to enable water utilities, public health agencies, and other professionals to provide safe and affordable drinking water to consumers.

The Foundation's mission is to advance the science of water to improve the quality of life. To achieve this mission, the Foundation sponsors studies on all aspects of drinking water, including resources, treatment, distribution, and health effects. Funding for research is provided primarily by subscription payments from close to 1,000 water utilities, consulting firms, and manufacturers in North America and abroad. Additional funding comes from collaborative partnerships with other national and international organizations and the U.S. federal government, allowing for resources to be leveraged, expertise to be shared, and broad-based knowledge to be developed and disseminated.

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Water Sector Workforce Sustainability Initiative

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1970 Oakcrest Avenue, St. Paul, MN 55113-2624

Jointly Sponsored by:

Water Research Foundation

6666 West Quincy Avenue, Denver, CO 80235-3098

and

American Water Works Association

6666 West Quincy Avenue

Denver, CO 80235-3098

Published by:



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ISBN 978-1-60573-072-1

Printed in the U.S.A.



Printed on recycled paper

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FOREWORD

The Water Research Foundation is a nonprofit corporation that is dedicated to the implementation of a research effort to help utilities respond to regulatory requirements and traditional high-priority concerns of the industry. The research agenda is developed through a process of consultation with participants and drinking water professionals. Under the umbrella of a Strategic Research Plan, the Research Advisory Council prioritizes the suggested projects based upon current and future needs, applicability, and past work; the recommendations are forwarded to the Board of Trustees for final selection. The Foundation also sponsors research projects through the unsolicited proposal process; the Collaborative Research, Research Applications, and Tailored Collaboration programs; and various joint research efforts with organizations such as the U.S. Environmental Protection Agency, the U.S. Bureau of Reclamation, and the Association of California Water Agencies.

This publication is a result of one of these sponsored studies, and it is hoped that its findings will be applied in communities throughout the world. The following report serves not only as a means of communicating the results of the water industry's centralized research program, but also as a tool to enlist the further support of the nonmember utilities and individuals.

Projects are managed closely from their inception to the final report by the Foundation's staff and large cadre of volunteers who willingly contribute their time and expertise. The Foundation serves a planning and management function and awards contracts to other institutions such as water utilities, universities, and engineering firms. The funding for this research effort comes primarily from the Subscription Program, through which water utilities subscribe to the research program and make an annual payment proportionate to the volume of water they deliver and consultants and manufacturers subscribe based on their annual billings. The program offers a cost-effective and fair method for funding research in the public interest.

A broad spectrum of water supply issues are addressed by the Foundation's research agenda: resources, treatment and operations, distribution and storage, water quality and analysis, toxicology, economics, and management. The ultimate purpose of the coordinated effort is to assist water suppliers to provide the highest possible quality of water economically and reliably. The true benefits are realized when the results are implemented at the utility level. The Foundation's trustees are pleased to offer this publication as a contribution toward that end.

David E. Rager
Chair, Board of Trustees
Water Research Foundation

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Executive Director
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ACKNOWLEDGMENTS

The success of a project of this nature depends on the expertise and participation of utility partners. The research team would like to acknowledge the following utilities for their participation in the project:

Albuquerque Bernalillo County, NM
American Water, NJ
Beaufort Jasper Water and Sewer Authority, SC
Bloomfield Township, MI
Broward County, FL
Castaic Lake Water Agency, CA
Central Arkansas Water, AK
City of Akron, OH
City of Henderson, NV
City of Lincoln, NB
City of Milwaukee, WI
City of Seattle, WA
City of Tempe, AZ
City of Tigard, OR
City of Tucson Water Department, AZ
City of Wyoming, MI
Clayton County Water Authority, GA
Coachella Valley Water District, CA
Columbus Water Works, GA
Denver Water, CO
JEA Water and Wastewater Systems, FL
Joint Water Commission, OR
Kenosha Water, WI
Macon Water Authority, GA
Manitowoc Public Utilities, WI
Maui Water, HI
Metro Vancouver, CANADA
Ohio American, OH
Orange Water and Sewer Authority, NC
Palm Beach County, FL
Pennichuck, NH
Portland Water District, ME
San Francisco Public Utilities Commission, CA
Santa Clara Valley Water District, CA

Tarrant Regional Water District, TX
Town of West Springfield, MA
Township of Orion, MI
West Basin Municipal Water District, CA

We would also like to recognize personally the Steering Committee Members that directed the work. Names preceded by an asterisk also served on the AdHoc Committee:

- Cheryl Davis, San Francisco Public Utilities Commission, CA
- *Craig Woolard, Anchorage Water and Wastewater Utility, AK
- Curtis Mitchell, Colorado Springs Utilities Department, CO
- *Dave Lewis, Kenosha Water Utility, WI
- *Glenda Dunn, City of Waco Water Department, TX
- *Jeanne Bailey, Fairfax Water, VA
- John Huber, Charlotte-Mecklenburg Utility, NC
- *Marsi Steirer, San Diego Water Department, CA
- Patrick Newland, Toronto Water, Ontario Canada
- Rosemary Panzano, American Water, NJ
- *Sally Mills, City of Tigard, OR
- *Scott Kelly, JEA Water and Wastewater Systems

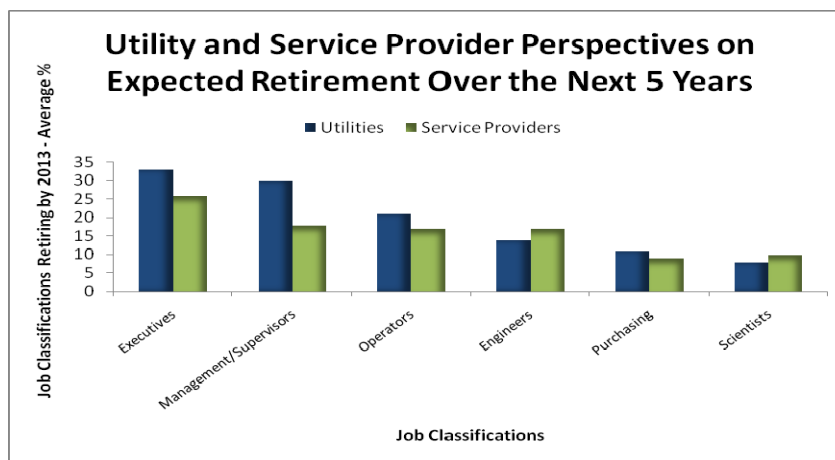
The research team would also like to express their thanks for the guidance and participation of Roy Martinez (Water Research Foundation project manager) for his advice and guidance.

EXECUTIVE SUMMARY

US LABOR FORCE CRISIS AFFECTS ALL INDUSTRY SECTORS

There is a workforce crisis in the utility industry caused by impending retirements and shifting demographics, increasing diversity, and a declining number of science and technical students receiving degrees. The challenges facing the water sector mirror the shift in the US labor force as a whole.

To an extent, the water sector is facing the baby boomer exodus sooner than other industries primarily because most are eligible to retire after thirty years of service. Baby Boomer retirement began about five years ago and is estimated to continue over the next 10 to 15 years. The numbers are reaching a critical stage. The estimates place the anticipated loss of current utility employees at between 30 to 50 percent within the next 10 years. Figure ES.1 is from the AWWA “State of the Industry Report” (Mann and Runge, 2008).



Source: “State of the Industry Report”, Runge and Mann, AWWA, 2008.

Figure ES.1. Numbers of retirements in water sector positions are on the rise

Utilities will feel the impact of these retirements most severely in areas requiring technical skills and knowledge such as Engineering and Operations. It has become increasingly difficult to recruit for these areas. Estimates are that the water supply and sanitary services sector will experience a growing need for additional employees – a potential increase of up to 45 percent in the coming years – due to new regulations, growth in infrastructure, security challenges, and customer demands.

According to a recent study by the Water Research Foundation and Water Environment Research Federation (WERF), 2005, retiring utility workers have an average of 24 years at the same utility. The water sector will be affected by the knowledge loss that accompanies the retirement of these long-term employees. Utilities face the risk of critical knowledge loss that leaves along with those employees exiting the organization. Workers may be taking a wealth of institutional knowledge with them into retirement. Organizations that have not adopted an effective knowledge management program and implemented sound practices for identifying and capturing critical knowledge may be hit with a “double whammy” as both the people and “what they know” exit the workforce.

In a survey of American Water Works Association (Ed Means, UMC 2008) section members, workforce planning was consistently cited as one of the top two issues facing utilities today. Another recent research project investigated the recruitment, development, and retention of operators and engineers (Water Research Foundation, *Workforce Planning for Water*

Utilities—Successful Recruiting, Training, and Retaining Operators and Engineers, 2008). Utilities reported they have been operating well below their funded staffing levels for some years now – a factor that directly affects training and staff retention. The same research indicates that workforce planning (including knowledge retention) is not viewed as “strategic” within most organizations. Workforce planning does not receive the same attention as regulatory and infrastructure issues, even though workforce planning directly affects the organization’s sustainability.

Primary Research Shows At-Risk Operational Functions

Primary research completed for this project included a survey conducted by the Steering Committee volunteers in reaching out to 40 utilities on the workforce development issues facing water and wastewater utilities. Fifty-two percent of the survey respondents were public agencies that are part of a City, County, or enterprise fund while 24 percent were public with independent governance. The remaining 24 percent of respondents were investor-owned or special operating districts.

Utilities were asked to list up to 20 mission critical classifications and functions where they have experienced or anticipate problems with quantity and or staff work preparedness. Based on a summary of all survey responses, for mission critical classifications, Water/Wastewater Treatment Operators and Collection/Distribution/ Transmission System Operators were the classifications at highest risk (shown in [Figure ES.2](#)). The operational functions most at risk for utilities were listed as Water Delivery Reliability, Customer Service, Environmental Stewardship, and Safety, Security, and Emergency Response.

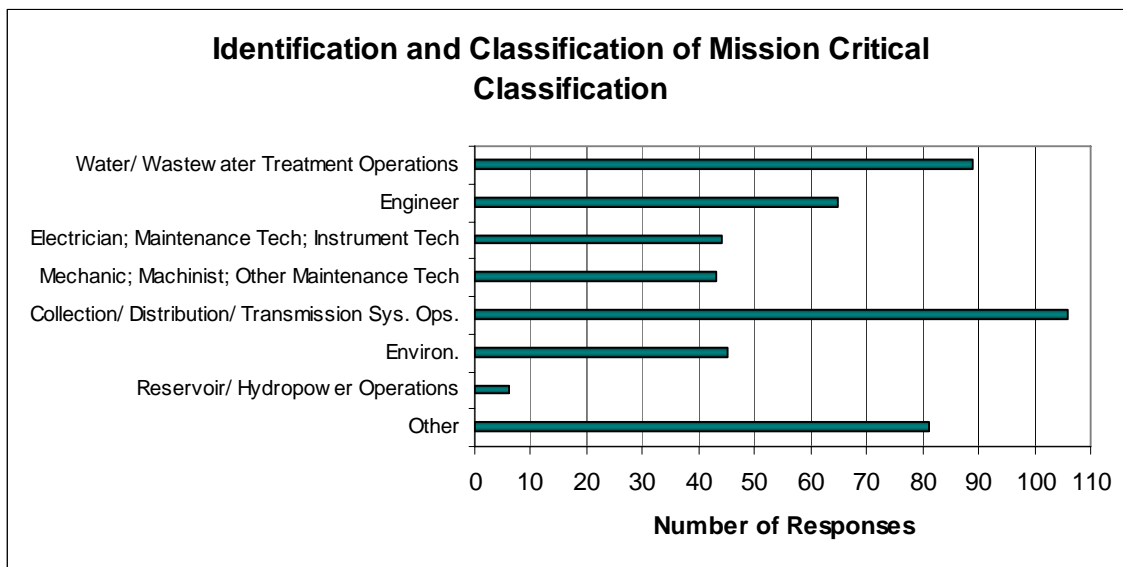


Figure ES.2. At-risk positions

The highest reported workforce development challenges within mission critical positions are Recruitment and Selection, and Knowledge Retention – closely followed by Classification issues and Staff Training.

The survey also posed a series of open-ended questions related to workforce development best management practices. Additional open-ended questions asked about respondents' experience related to opportunities for collaboration.

Secondary Research Focuses on Collaborative Initiatives

Secondary research focused on identifying utility and other industry collaborative programs that may serve as models or resources to help define collaborative water sector initiatives. The secondary research reviewed previous water sector and other industry research such as energy, manufacturing, and construction. This research identified collaboration programs and tools other industries are using to address workforce issues.

As shown in [Table ES.1](#), a number of these existing initiatives were identified that could also prove to be beneficial to the water sector collaborations:

Table ES.1
Initiatives potentially beneficial to water sector

Industry-Specific	Regional	National
<ul style="list-style-type: none"> • Energy • Manufacturing • Engineering • Construction • Nursing • Tourism • Teaching 	<ul style="list-style-type: none"> • State • Provincial • Women • Trades/Union • Utilities • Public Sector 	<ul style="list-style-type: none"> • Industry centered (e.g., Center for Energy Workforce Development)

Funding Sources May Provide Assistance for Workforce Development Programs

Many large U.S. companies have established philanthropic foundations dedicated to supporting programs in their communities through grant contributions. Some grants are designated for programs dedicated to specific areas (such as health care or disadvantaged children). Some are dedicated to the improvement of science, technology, engineering, and math (STEM) programs at various educational levels. Many programs help displaced workers obtain new jobs, provide educational opportunities for minorities, or assist young adults (who do not choose college) in identifying an alternative career.

There are two widely-used funding models commonly used by organizations creating workforce development programs. The first model is based on obtaining funds from state and local government organizations. Various groups come together to form a collaborative with the goal of obtaining funding from the state and local level Workforce Investment Boards funded by the U.S. Department of Labor.

The second widely-used funding model includes developing a similar collaborative; however, this group focuses on creating and obtaining funding from a private funding organization, such as a private investment group or private foundation. A workforce development program could be created using funds from either source or a combination of these sources.

Industry Representatives Met to Share Vital Information and Define Opportunities for Sector Collaboration

A two-day workshop was held in Arlington Virginia on November 6th and 7th, 2008 to identify opportunities for collaboration within the water utility industry. Workshop attendees included utility presenters and participants, project Steering Team members, representatives from AWWA, Water Research Foundation, Rural Community Assistance Program, AMWA, WEF, WERF, and NACWA, and government representatives from agencies such as the U.S. Environmental Protection Agency, U.S. Department of Labor, Veterans Affairs, U.S. Department of Education, and the American Association of Community Colleges. The information presented and discussed at the workshop included:

- The primary and secondary research conducted for this project on utility and other sector collaborative initiatives
- Utility survey respondents presentations on workforce management practices in use
- Water sector association presentations on their current initiatives and collaborative efforts
- Updates on activities from government associations such as the Departments of Labor, Education and Veteran's Affairs and the U. S. Environmental Protection Agency (EPA)
- Presentation on the energy sector collaborative initiative Linking with community colleges

Workshop attendees participated in several facilitated discussions aimed at identifying a series of collaborative initiatives that could be implemented in the water sector at the local, regional and national levels. Recommendations for collaboration included:

- Employee development such as training, mentoring, internships, apprenticeships, work sharing and certification preparation
- Use of new tools and technologies for recruiting, branding and training such as podcasts, social networks, wikis, splash pages, or web-based training
- Industry image and branding or, perhaps more appropriately, re-branding the water sector to appeal to Gen X and Y workers
- Certification to support employee mobility
- Compiling and providing meaningful data to quantify workforce shortages
- Connecting with schools to encourage students to consider engineering and science programs and to offer apprenticeship programs
- Working with educators such as the American Association of Community Colleges and Partnership for Environmental Technical Education (PETE) to align education programs
- Working with Workforce Investment Boards to integrate and fund workforce development initiatives to enhance training for the water sector
- Working with unions to partner on workforce activities
- Addressing civil service regulations that impact a utility's ability to hire and addressing compensation differences

These workshop recommendations were synthesized into three primary project recommendations:

- Enhance the water sector job image: Rebrand existing jobs in the water sector by creating an outreach campaign that includes situation analysis, goals, objectives, market research, target groups, potential partners, communications program and strategies to appeal to current and future labor pools and to improve outreach to educational institutions from K-12 to universities. The focus would be to develop an image to attract workers to water/wastewater utilities as the “employer of choice”.
- Improve water sector career pathways definition: Transform existing fragmented, limited job positions into career pathways to accommodate mobile job opportunities; and create standard, certified job classifications by determining common skill-based competencies and training requirements, and Career Clusters as identified by the US Department of Labor (DOL) and US Department of Education (DOE).
- Establish a water workforce resource clearinghouse: Develop and implement a clearinghouse that promotes sharing of content, information and best practices among utilities and partnering organizations.

Several recommendations were provided for areas of future research. Many of the research recommendations would provide data and templates to implement the three primary projects recommended.

The Many Benefits of Collaboration

Opportunities for collaborating to address workforce issues in the water sector are vast. This research report provides guidance for the industry to move forward by taking action in a collaborative manner. In “Jobs for the Future”, Geri Scott discusses the benefits of collaboration and the reasons that funding sources collaborate on workforce issues. Many of the reasons she cites in her article are directly applicable to the water sector as we begin to come together to address our workforce issues:

- To unleash the power that comes from jointly committing resources to address a large and immediate problem
- To catch the attention of other organizations in the sector to show the benefits of collaboration
- To join together around a strategic vision to better attract funding, workforce boards, and government decision-makers to support the collaboration
- To impact public policy that impacts the water utility sector at the federal, state, and local levels
- To match the right collaborative solution to the right set of circumstances in a national, regional, or local setting
- To share learning, training, and benchmarking across the collaborative

Successful workforce partnerships and collaborations engage businesses in the structure of the partnership as a formal part of decision-making and ongoing governance. Partnerships have a long-term impact on the outcome of their partners, individuals, and the systems that affect them.

CHAPTER 1

PROJECT BACKGROUND

The purpose of this report is to frame the challenges causing the crisis in the water and wastewater utility industry, provide information on the specifics of the challenges and opportunities for addressing them, review successful utility and other industry collaborative initiatives that are already working, and propose a process for moving the utility industry forward in designing and implementing collaborative initiatives.

Topics addressed in this report include identification of mission critical job functions and other classifications with the highest levels of vulnerability, background information on other industry collaborative efforts, potential funding sources for a water sector initiative, strategies for development of series of water and wastewater sector national initiatives, and the outline for the two-day workshop of interested utilities and other associations that was conducted on November 6 and 7, 2008 in Arlington Virginia.

US LABOR FORCE CRISIS IMPACTS ALL INDUSTRY SECTORS

Employers are faced with many diverse challenges as the Baby Boomer generation exits full-time, 9 to 5 employment, and Generation X and Y take up the reins of managing a culturally and generationally diverse workforce. A changing economy makes it difficult for employers to predict the future needs for workers in many industry sectors.

- As US employers shed approximately one quarter of a million jobs in the first four months of 2008 (Bureau of Labor statistic), several studies show a continued need for specific positions such as engineers, technicians, sales representatives, accountants, IT staff, machinists, machine operators, skilled trades people, mechanics, laborers, and production operators. (Manpower 2008).
- In the energy sector, reports show an increased need for linemen and other technician positions over and above the current vacancies waiting to be filled (Energybiz) based on the need for constructing new and replacement infrastructure while maintaining the existing grid.
- Skilled trades in construction – carpenters, welders, plumbers, electricians, and masons – remain difficult to fill even though 365,000 of workers in those classifications were laid off in 2007-08, with the housing crisis causing a decline of 65,000 jobs in construction (preliminary BLS data).
- Even as thousands of IT jobs are off-shored each year, the demand for software developers, system engineers and network administrators is strong (Manpower). Finding people who are well rounded, adept in communicating with lines of business, and able to manage are particularly in demand in the IT sector, although this need is reflected in other sectors as well.

Shifting Demographics Impact US Labor Market

This shifting demographic picture has been well publicized. The “generations” reflected in today’s workforce are characterized in [Table 1.1](#).

Table 1.1
Population of Generations

Generation	Birth Years/Current Age	Population
Traditional	Born: Before 1946 Over 62 years old	75 Million
Baby Boomer	Born: 1946 – 1964 Between 44 – 62 years	80 Million
Generation X	Born: 1965 – 1981 Between 27 – 43 years	46 Million
Generation Y	Born: After 1982 Under 26 years old	76 Million

All sectors in the US labor market are impacted by the shift occurring in these labor groups. Most Traditionals and many Boomers are retiring; and many more of these generations will follow this group into retirement over the next 10 to 15 years, as approximately 12,000 boomers turn 50 daily (Johnson, 2008).

In an AARP study, eighty five percent of respondents (Traditionalists and Baby Boomers) indicated their intention to work full or part time, or start their own business in lieu of retirement. The reasons for continuing to work vary from economic need to the need to maintain medical insurance to continue to have something to do that is meaningful. With many of the Boomer generation continuing to participate in the labor market there will be a diverse mix of values regarding work and how it is approached by the Boomer and Generation X employees.

Value differences among generations are well documented in the literature today and often witnessed in real life employment situations. Baby Boomers are the generation willing to put in 60+ hour work weeks to gain a competitive advantage and stay on top. The boomer generation has been responsible for much of the growth in the nation's economy over the past 30 years, yet Boomers have the lowest satisfaction rates with their employers at 74% (versus 85% for Traditionalists).

Many in Generation X witnessed the life imbalance seen in their parents and older workers and refuse to work in that manner. This generation prefers working in teams and joint ventures. They are an eclectic group that desires to explore new ideas, do meaningful and challenging work, and are more mobile in changing jobs.

Generation Y views the workplace through an overall global perspective. For this generation, work must have meaning, and communication is instantaneous via social networking. Both Generations X and Y expect to have input into work problems and expect respect and inclusion from co-workers.

Employers are struggling as these value differences present themselves in the workplace. They also struggle to adopt a realistic succession plan with the uncertainty around retirement versus full or part time work for boomers in their employ. Managing the mix of generations is a struggle and requires superior interpersonal and communication skills.

Diversity in Workforce Compounds the Workplace Challenges

During this same period of shifting generation groups in the labor force, ethnic diversity is on the increase. The US Census Bureau anticipates increases in ethnic populations as shown in [Figure 1.1](#).

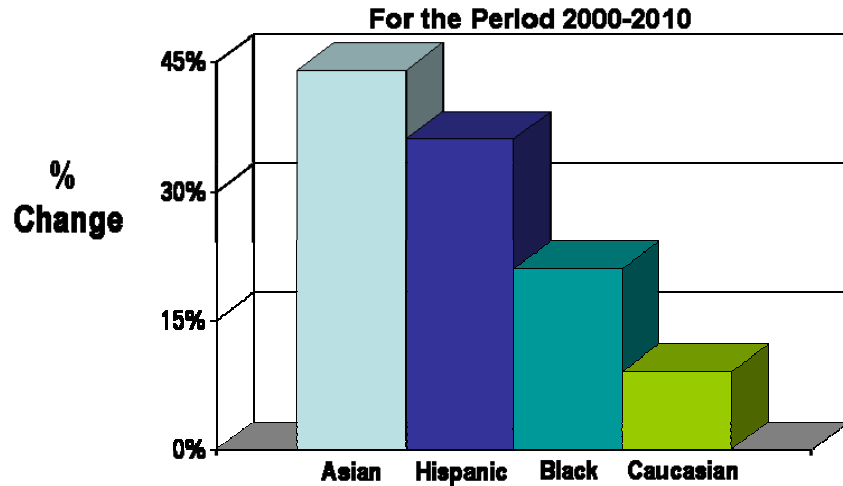


Figure 1.1. Ethnic Diversity is Increasing

By the end of this same 10 year period, females in the labor force are anticipated to outnumber men by 6 million, with the number of Hispanic women in the labor force growing from 6.7 to 9.2 million. [Figure 1.2](#) shows Bachelor’s degrees awarded by race or ethnicity from 1995 through 2004. Minority women receiving degrees represent the incoming engineer to industry organizations and employers must learn to effectively recruit to these diverse population groups.

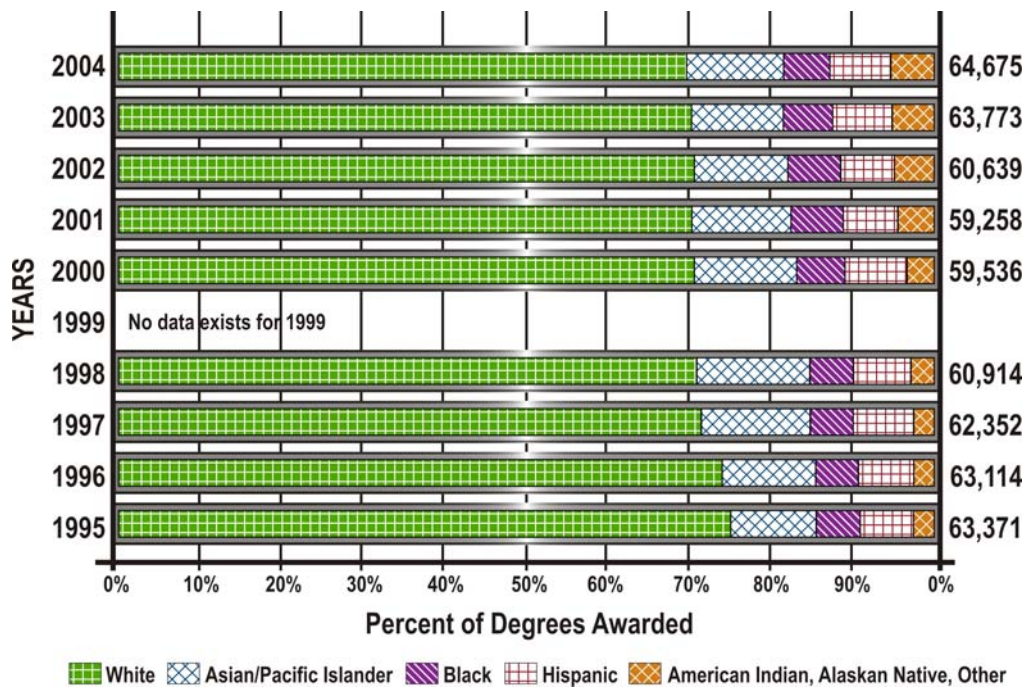


Figure 1.2. Bachelors Degrees Awarded

This shifting ethnic diversity adds a layer of change for which individual employers must prepare by ingraining diversity into the culture of their workplace. A 2008 Water Research Foundation report, *Workforce Planning for Water Utilities—Successful Recruiting, Training, and Retaining Operators and Engineers*, found diversity-friendliness is a key to successful retention by out-of-the-industry organizations. Proactively planning for demographic changes, understanding the needs and values of diverse populations, and focusing on co-existence are keys to a successful diversity program.

Lack of STEM Education in the US

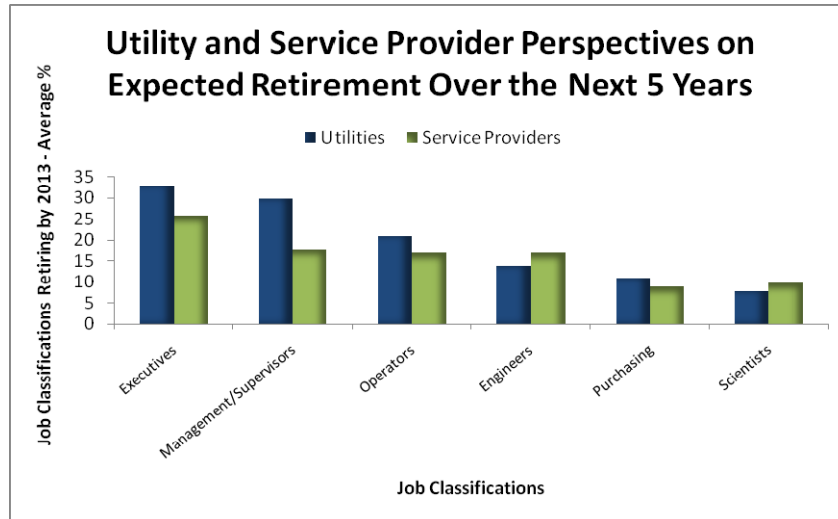
By 2012, the US faces a shortage of 500,000 engineers and scientists. The number of students earning bachelors or masters degrees in science or technical fields declined from 1 in 6 in the year 1960 to 1 in 10 in 2000. Unlike European and Middle Eastern nations, the United States has not effectively promoted and funded advanced education in technical skills and knowledge, an area referred to as STEM (Science, Technology, Engineering, and Math) during the last twenty years. The US now faces a shortage of new workers with the right mix of technical and interpersonal skills to replace those exiting the workforce.

What This Means for the Utility Sector

The challenges facing the water and wastewater utility sector mirror the shift in the US labor force and to an extent utilities are facing the boomer exodus earlier than the general population. In the utility sector, it is projected that the exodus of utility employees due to retirement and private sector employment that began approximately 5 years ago will continue over the next 10 – 15 years. This represents an anticipated loss of 30 to 50 percent of the current utility workforce to retirement within 10 years. Consider these facts from a Water Research Foundation/WERF report, “Succession Planning for a Vital Workforce in the Information Age” published in 2005:

- The current average age of water utility workers is 44.7
- The current average age of wastewater workers is 45.4
- The average retirement age for utility personnel is 56

In the Northeast and the West, the situation is more severe for plant operators. Plant operators in the Northeast (average 49.6 years old) and in the West (average 46.9 years old) are significantly older than plant operators in the Midwest (average 41.2 years old) and the South (average 40.0 years old). Similarly, plant operators in metropolitan areas (average 42.4 years old) are older than plant operators in non-metropolitan areas (average 36.9 years old). Thus succession planning—at least with regard to plant operators—is a slightly more pressing issue in the Northeast and West than it is in the South and Midwest regions. It is also more of an issue for utilities in metropolitan areas than in non-metropolitan areas. [Figure 1.3](#) depicts anticipated utility retirements by 2013.



Source: "State of the Industry Report", Runge and Mann, AWWA, 2008.

Figure 1.3. Projected Utility Retirements By 2013 (AWWA 2008 State of Industry Report)

It is projected that in the next ten years, 37% of water utility workers and 31% of wastewater utility workers will retire. Utilities will feel the impact of these retirements most severely in areas requiring technical skills and knowledge such as Engineering, Plant Operations, Water Quality, and other technical areas that have become increasingly difficult to recruit. Estimates are that the water supply and sanitary services sector will experience a growing need for additional employees potentially by 45% in coming years due to new regulations, infrastructure growth, security challenges and customer demands (BLS).

According to a recent Water Research Foundation study, retiring utility workers have worked an average of 24 years in the same utility. The utility industry may particularly feel the impact of the knowledge loss that accompanies the retirement of long-term employees.

Recruiting new workers with the right technical and managerial skills is not the only issue utilities face. In addition to the shortage in the number of workers to recruit and the need for updated recruiting methods, utilities face the risk of critical knowledge loss from employees who are exiting the organization to retirement or other options. There is a high possibility that exiting workers are taking a wealth of institutional knowledge with them into retirement. Organizations that have not adopted an effective knowledge management program and implemented sound practices for identifying and capturing critical knowledge may realize a double whammy from these retirements as both people and "what they know" exit the workforce.

Utility culture is not typically focused on process and procedural documentation, knowledge sharing, or knowledge transfer – particularly in recent times of lean operations and budget restrictions. In a 2008 Water Research Foundation report, *Workforce Planning for Water Utilities—Successful Recruiting, Training, and Retaining Operators and Engineers*, results of utility surveys show that utilities are addressing labor force issues through formal workforce planning. The challenge of managing a multi-generational, multi-ethnic workforce will continue for water utilities across the nation.

In a survey of AWWA sections, workforce planning and total water management were consistently cited as the top two issues facing utilities today. In the same 2008 Water Research

Foundation report cited in the previous paragraph, utilities report they have been operating well below their funded staffing level for some number of years now, a factor that directly impacts training and retention of staff. The same research indicates that workforce planning (including knowledge retention) is not viewed as “strategic” within most organizations and is not given the same attention as regulatory and infrastructure issues – even though workforce planning directly addresses sustainability of the organization.

Research Led to This Collaborative Initiative

Several factors converged simultaneously to initiate this research project.

- Florida and California/Nevada AWWA Sections invited Texas, and Wisconsin to begin a dialogue on seeking collaborative solutions to address impending labor force issues. Both Florida and California/Nevada had already established state sector-wide collaborative efforts as outgrowths out of visioning processes associated with prior Water Research Foundation projects.
- The West Coast Water Utilities Workshop on Workforce Development was held to initiate the workforce development component of a Water Research Foundation project relating to models for inter-agency collaboration.
- The 2008 Water Research Foundation report, *Workforce Planning for Water Utilities—Successful Recruiting, Training, and Retaining Operators and Engineers*, identified an industry effort as key to addressing issues that face multiple utilities, such as operator certification or state legislation impacting retirement regulations; or areas such as development of apprenticeship programs that can benefit multiple utilities.

The proposal for this research effort was approved by the Water Research Foundation with the expectation that the project will define viable collaborative initiatives to address workforce issues – projects that can be implemented in follow up initiatives. Additionally this project will provide a summary of effective practices for addressing workforce issues that have been implemented by water and wastewater utilities or other industries identified through the project’s secondary research. The approach to this research project is presented in [Figure 1.4](#).

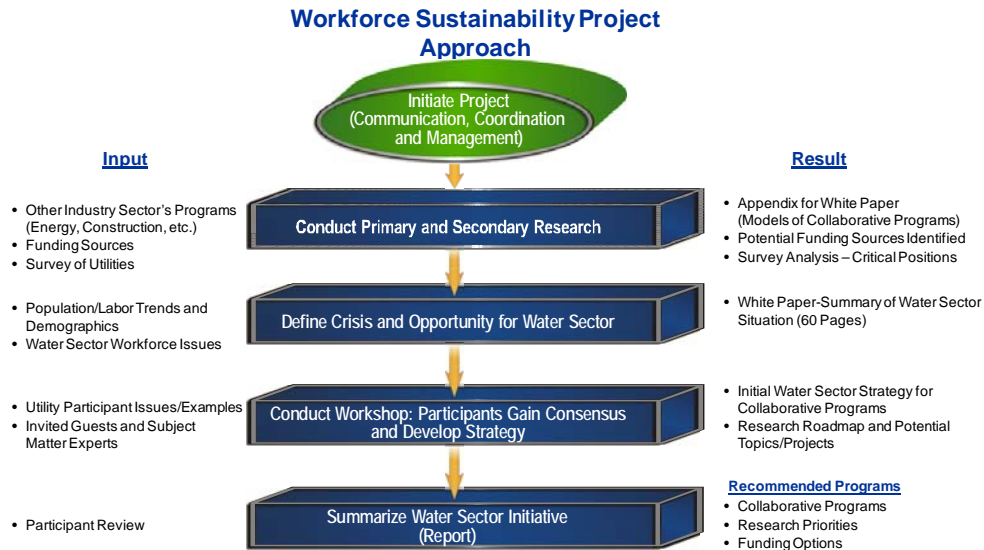


Figure 1.4. Project Approach

A key event of this research project was a two-day workshop conducted in Arlington Virginia on November 6 and 7, 2008. The objectives of the workshop were to define a collaborative initiative(s) including funding sources to address workforce issues at a national level. Workshop participants included utility representatives, association and legislative representatives. Results of the workshop are identified in Chapters 6 of this report.

Purpose and Organization of This Report

This report was written to provide readers with an understanding of workforce constrictions faced by water and wastewater utilities.

An Executive Summary provides an overview of the material presented in this report.

- **Chapter 1** presents a snapshot of issues facing the US labor force and utilities.
- **Chapter 2** presents the results of the primary research conducted for this project – research that specifically identifies positions and functions that are at risk in US utilities as a result of the changing labor force.
- **Chapter 3** presents secondary research conducted for this project. This research focuses on effective workforce practices in use by other industries. The research is presented by specific industry, geographic region, utilities, public sector and national initiatives.
- **Chapter 4** presents a detailed listing of potential funding sources for a utility sector collaborative initiative(s).
- **Chapter 5** presents a possible model for developing a water and wastewater sector collaborative program at the national, regional and local levels.
- **Chapter 6** presents recommendations for action at the local, regional and national levels, and recommendations for future research.
- **Appendix A** contains the Workforce Survey Form distributed to utilities.
- **Appendix B** presents the agenda and summary discussion of the November workshop.

CHAPTER 2 PRIMARY RESEARCH – UTILITY SURVEY

Primary research for this project consisted of a survey on workforce development issues facing water and wastewater utilities. A survey form (included as Appendix A) was completed by 33 utilities and the results of those responses are summarized in this chapter.

UTILITY PROFILE DATA

Figure 2.1 shows that 52% of survey respondents are public agencies that are part of a City, County or enterprise fund, while 24% are public with independent governance. The remaining survey respondents are investor-owned or special operating districts.

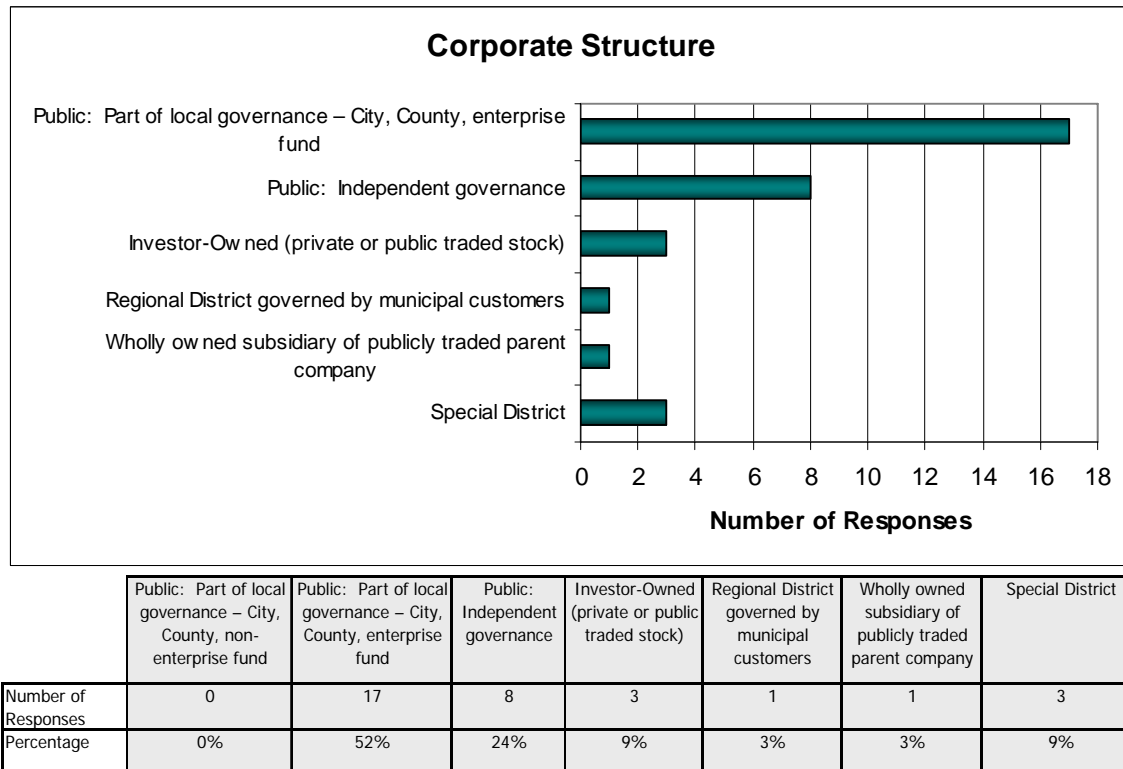


Figure 2.1. Corporate structure

Fifty-eight percent of respondents are governed by a Board of Directors or Commissioners and 42% are governed by a City or County. Thirty-eight percent are bound by Civil Service regulations, and 63% are not.

Services provided by the responding utilities are shown in Figure 2.2. Potable water treatment and distribution and wastewater collection and treatment are most commonly provided services.

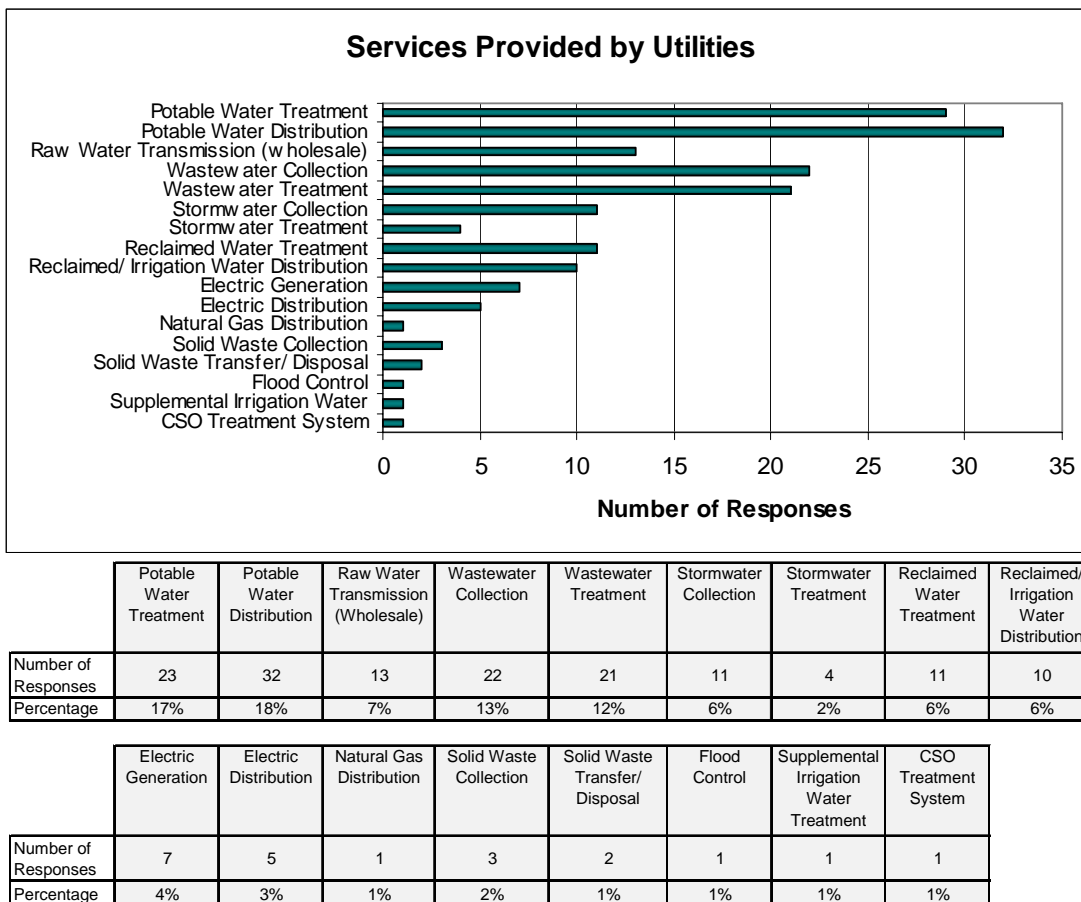


Figure 2.2. Services provided by responding utilities

The majority of survey respondents represent medium to large utilities. Fifty-six percent serve a population of over 100,000 and 31% serve a population of over 1million. Thirty two percent have over 1,000 employees; 13% have 500 – 1,000 employees; 26% have 251 – 500 employees; 19% have 101 – 250 employees; and 10% have less than 100 employees. In terms of employee unions, 34% are unionized, another 34% are partially unionized, and 31% are not unionized.

SUMMARY RESULTS

The data in this chapter presents a summary of all survey responses related to mission critical classifications and functions – meaning those positions and functions for which utilities have not been able to successfully recruit sufficient staff with adequate qualifications. Utilities were asked to list up to 20 mission critical classifications where they have experienced or anticipate problems with quantity and/or staff work preparedness. The data presented in this chapter summarizes the 20 classifications identified as mission critical for all utilities responding to the survey. Not all utilities listed 20 classifications as mission critical, so the number of responses for each data point presented in this discussion varies.

Based on a summary of all responses of mission critical classifications, Water/Wastewater Treatment Operators and Collection/Distribution/Transmission System Operators are the classifications at highest risk for experiencing problems with quantities of employees and/or staff work preparedness as shown in [Figure 2.3](#).

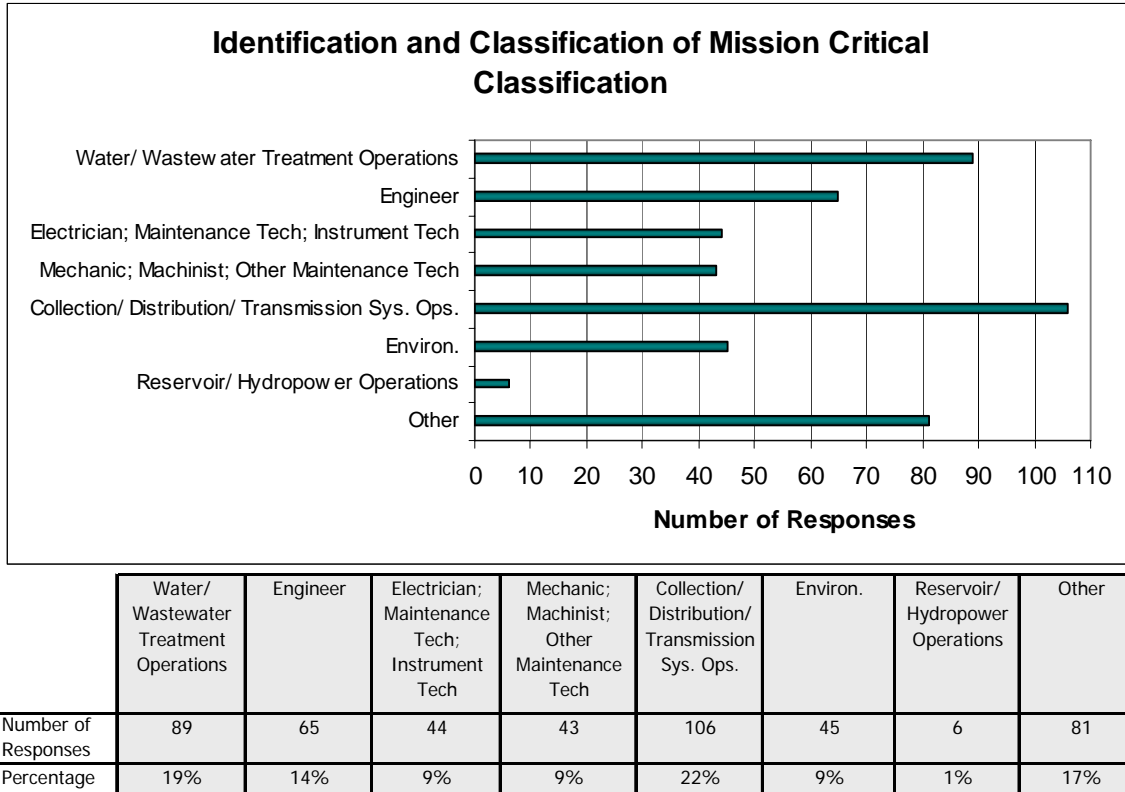
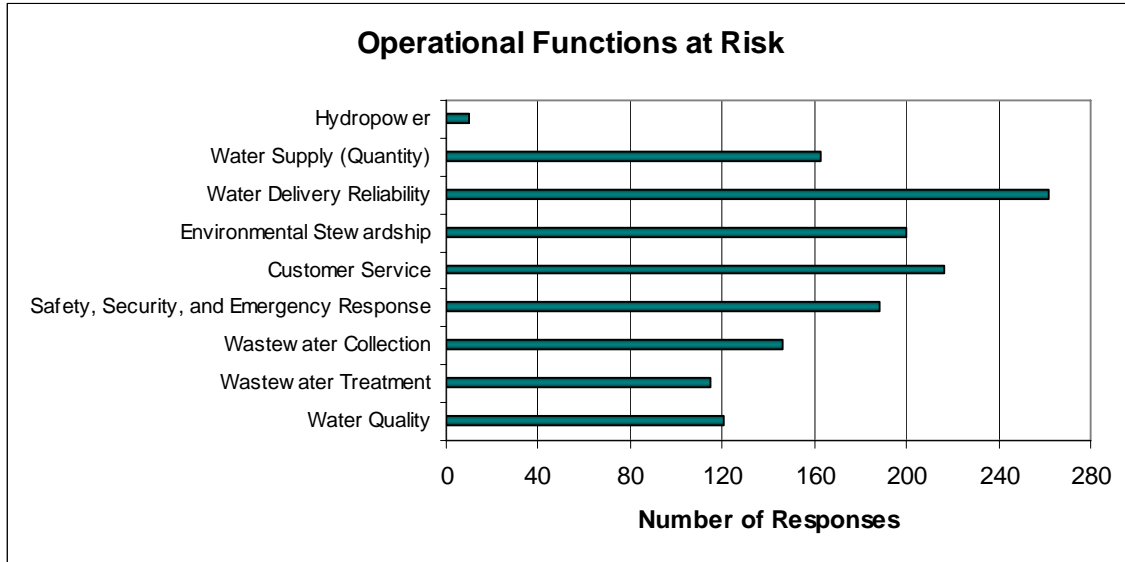


Figure 2.3. Mission critical classifications

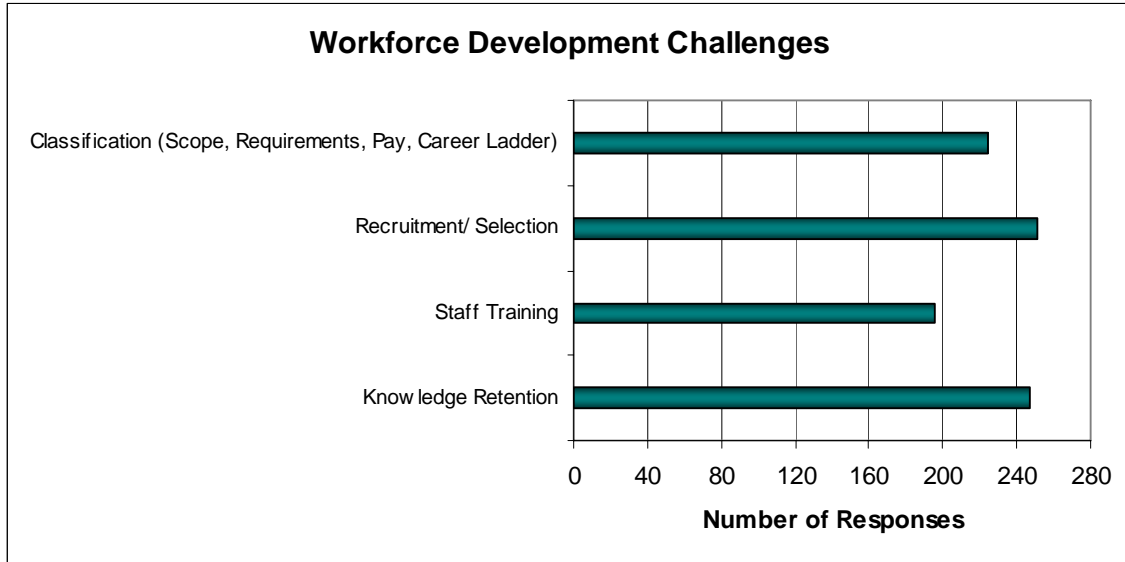
Based on the classifications identified by survey respondents, the operational functions most at risk for utilities are Water Delivery Reliability, Customer Service, Environmental Stewardship and Safety, Security, and Emergency Response as shown in Figure 2.4.



	Hydropower	Water Supply (Quantity)	Water Delivery Reliability	Environmental Stewardship	Customer Service	Safety, Security, and Emergency Response	Wastewater Collection	Wastewater Treatment	Water Quality
Number of Responses	10	163	262	200	216	188	146	115	121
Percentage	1%	11%	18%	14%	15%	13%	10%	8%	9%

Figure 2.4. Operational functions at risk

The highest reported workforce development challenges with the mission critical positions are recruitment and selection and knowledge retention, although classification issues and staff training follow closely (shown in Figure 2.5).



	Classification (Scope, Requirements, Pay, Career Ladder)	Recruitment/ Selection	Staff Training	Knowledge Retention
Number of Responses	224	251	196	247
Percentage	24%	27%	21%	27%

Figure 2.5. Workforce development challenges

Figure 2.6 presents a retirement vulnerability analysis for the mission critical positions identified in the survey. So this data applies directly to operators in treatment, distribution and collections.

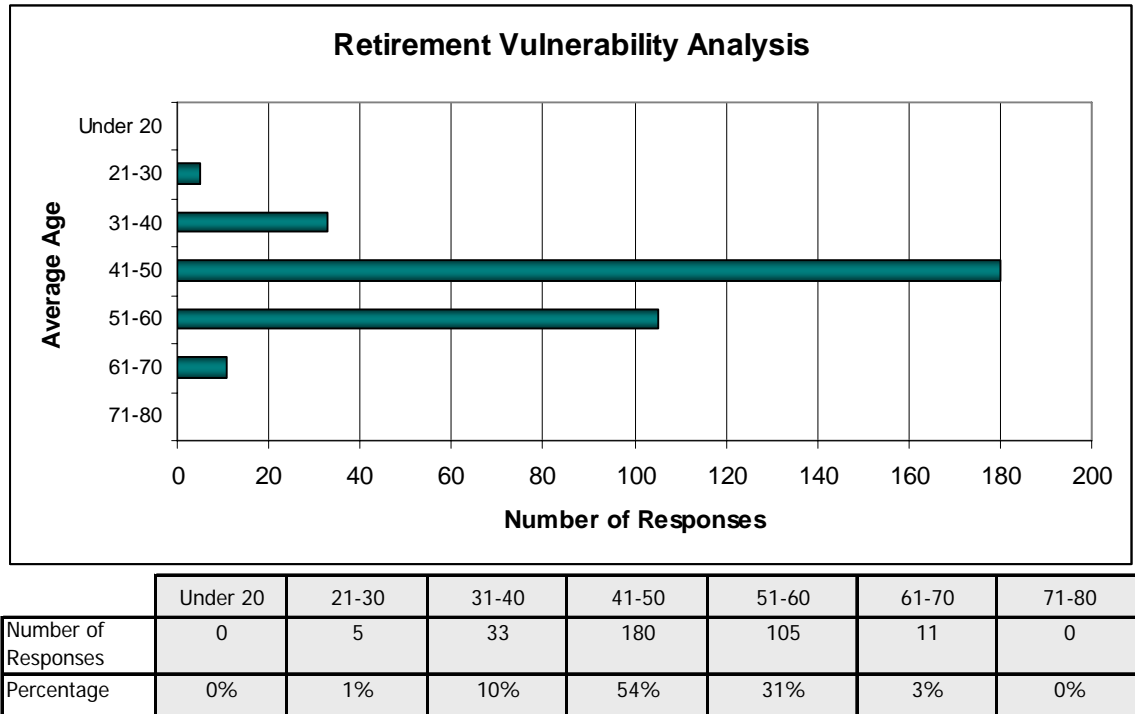
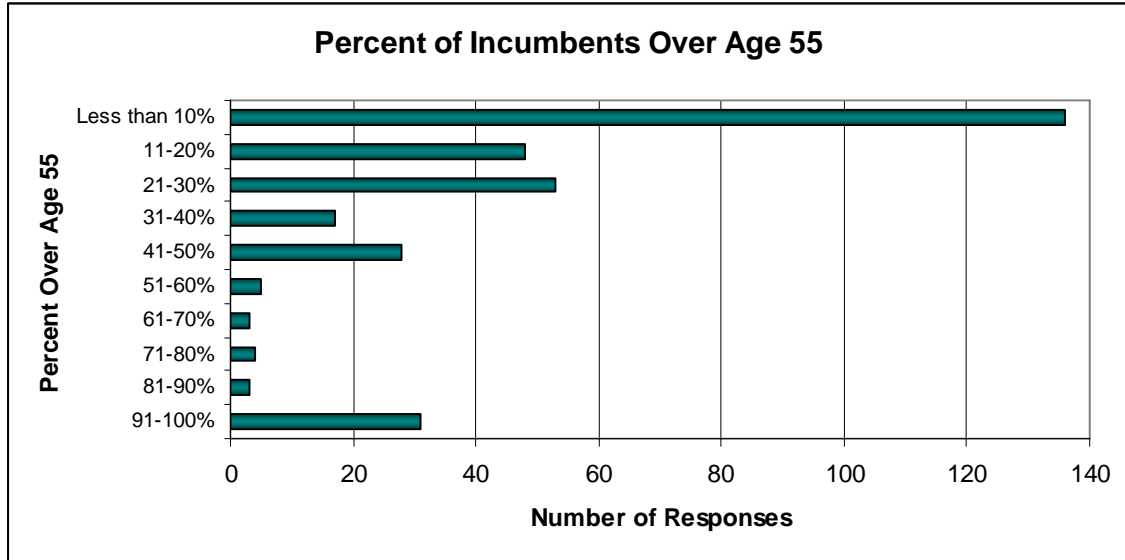


Figure 2.6. Retirement vulnerability based on age

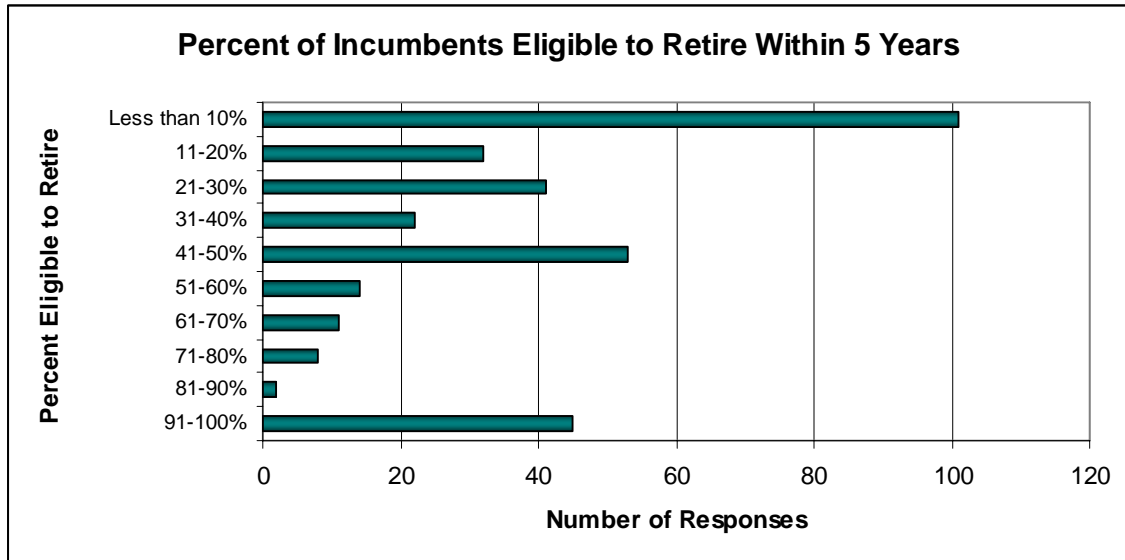
Figure 2.6 shows that most operators in treatment, distribution and collections are within the age range of 41 – 50 (54%) with a second set potentially closer to retirement in the 51 – 60 age range (31%). A conclusion could be drawn that less than 11% of operators in treatment, distribution and collections are under the age of 41. This confirms the findings of two previous Water Research Foundation research reports.

Of the mission critical classifications listed by survey respondents, 9% have employees over the age of 55 (32 of a total 328 classifications listed); and 14% of those are eligible to retire within 5 years (45 of a total 329 classifications listed). This data is presented in Figures 2.7 and 2.8.



	Less than 10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
Number of Responses	136	48	53	17	28	5	3	4	3	31
Percentage	41%	15%	16%	5%	9%	2%	1%	1%	1%	9%

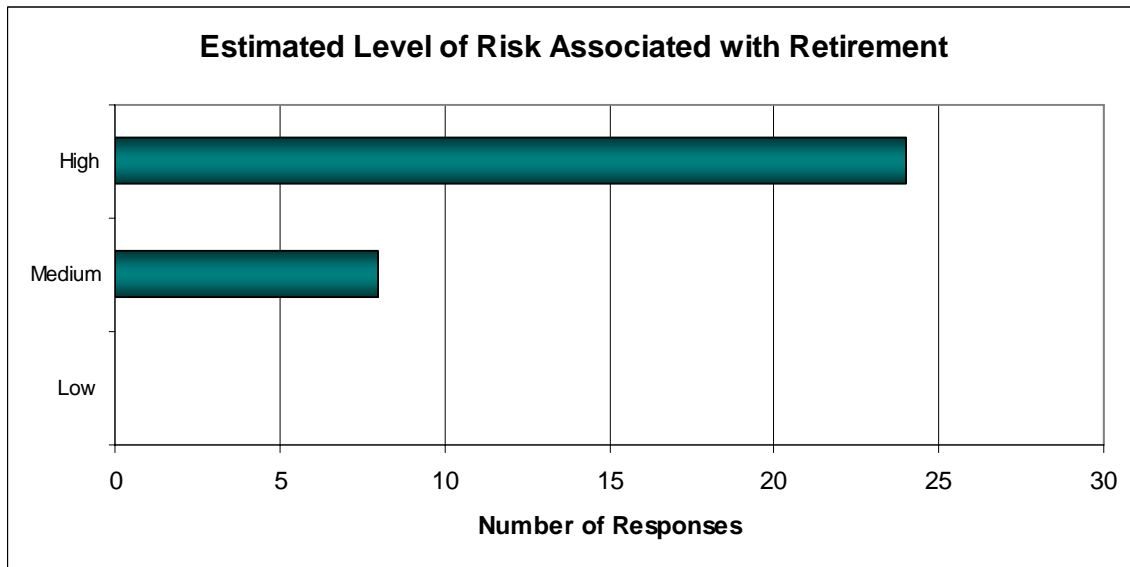
Figure 2.7. Percent of incumbents over age 55



	Less than 10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
Number of Responses	101	32	41	22	53	14	11	8	2	45
Percentage	31%	10%	12%	7%	16%	4%	3%	2%	1%	14%

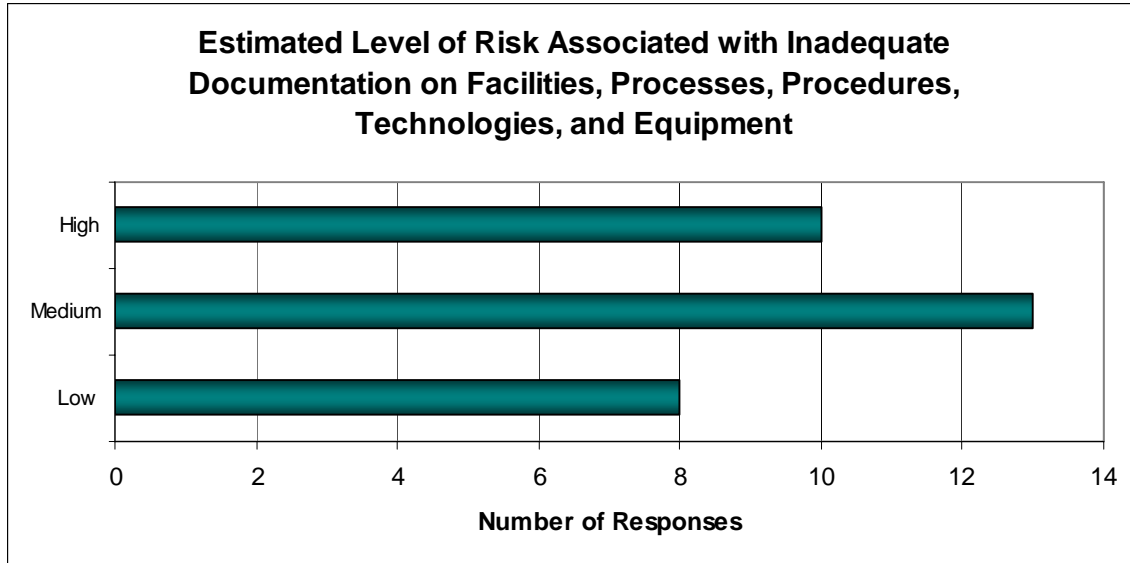
Figure 2.8. Percent of incumbents eligible to retire within 5 years

Factors identified by utilities that posed the greatest risk to ensure employees in mission critical positions had the skill to perform their work reliably included the risk associated with retirement of seasoned employees. Utilities identified retirement (Figure 2.9) as posing the highest level of risk in maintaining skill levels. Other risk factors identified as contributing to maintaining skill levels include risk associated with inadequate documentation on facilities, processes, procedures, technologies and equipment (Figure 2.10). A medium to low risk factor, turnover in utilities, is also a contributor to the overall risk of knowledge loss (Figure 2.11)



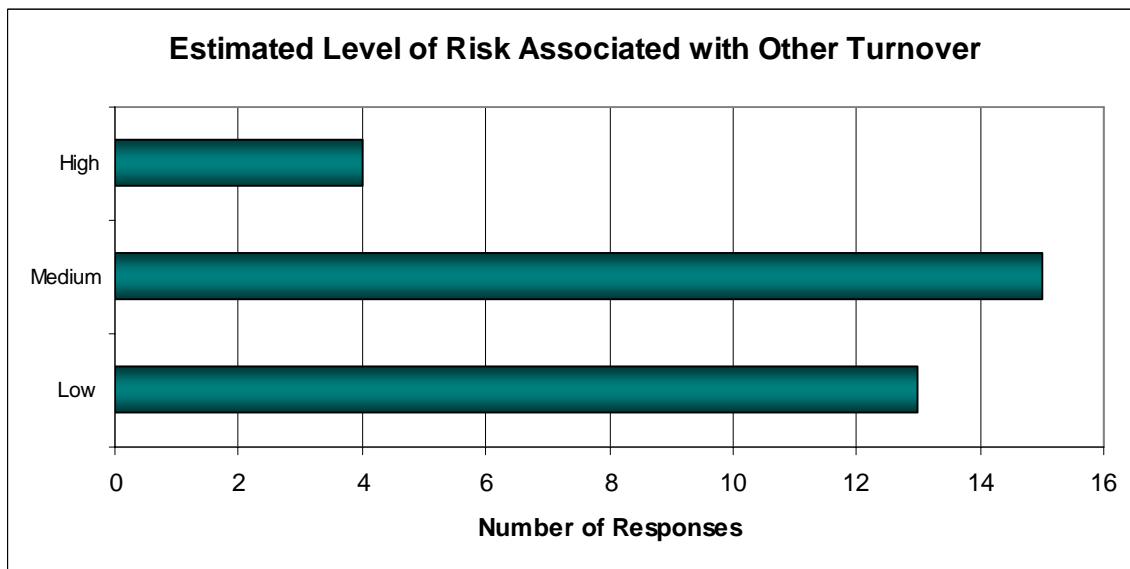
	High	Medium	Low
Number of Responses	24	8	0
Percentage	75%	25%	0%

Figure 2.9. Risk of retirement on mission critical positions



	High	Medium	Low
Number of Responses	10	13	8
Percentage	32%	42%	26%

Figure 2.10. Risk of Inadequate documentation related to work performed by mission critical classifications



	High	Medium	Low
Number of Responses	4	15	13
Percentage	13%	47%	41%

Figure 2.11. Risk of turnover on mission critical classifications

Evaluated together, [Figures 2.9](#) through [2.11](#) indicate a high risk of knowledge loss for utilities responding to the survey.

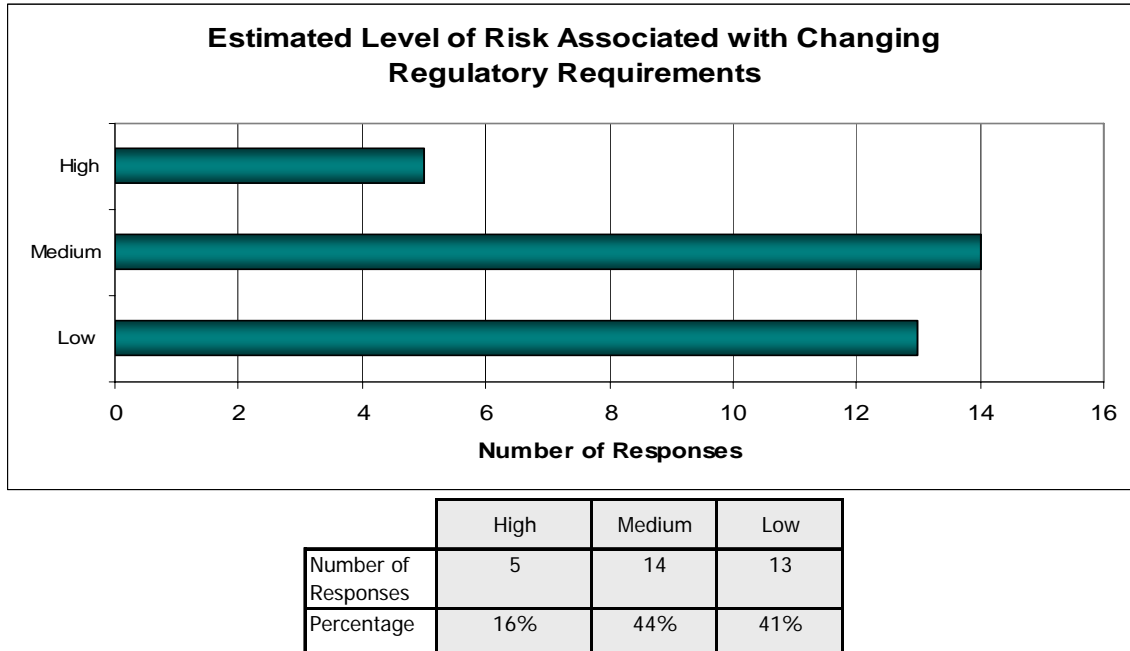


Figure 2.12. Risk associated with changing regulatory requirements related to work performed on mission critical classifications

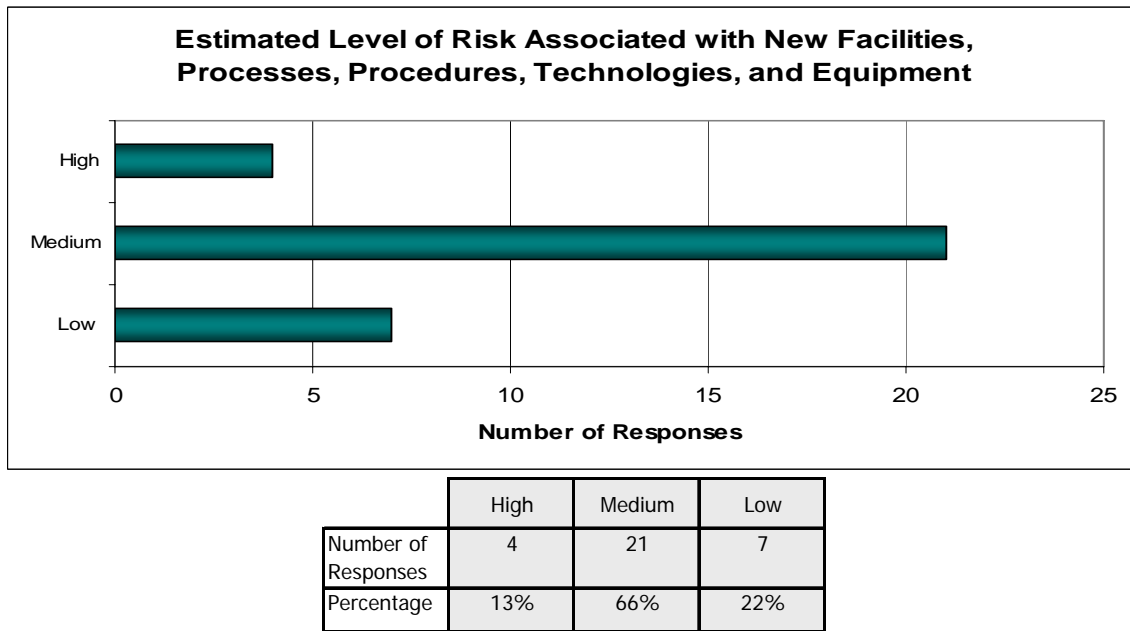
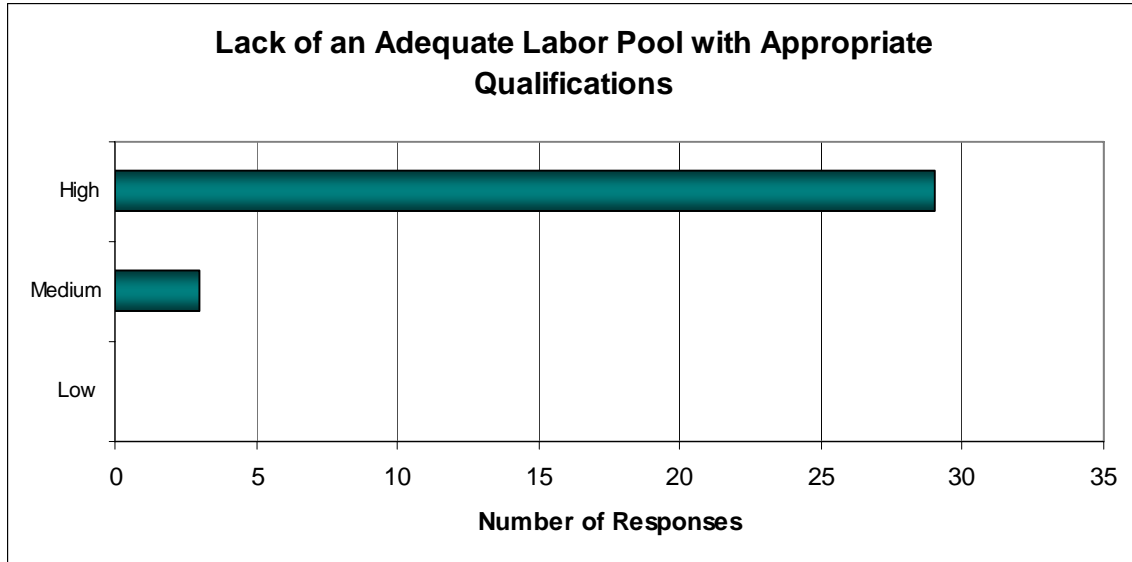


Figure 2.13. Risk of new facilities, processes, procedures, technologies, and equipment on mission critical classifications

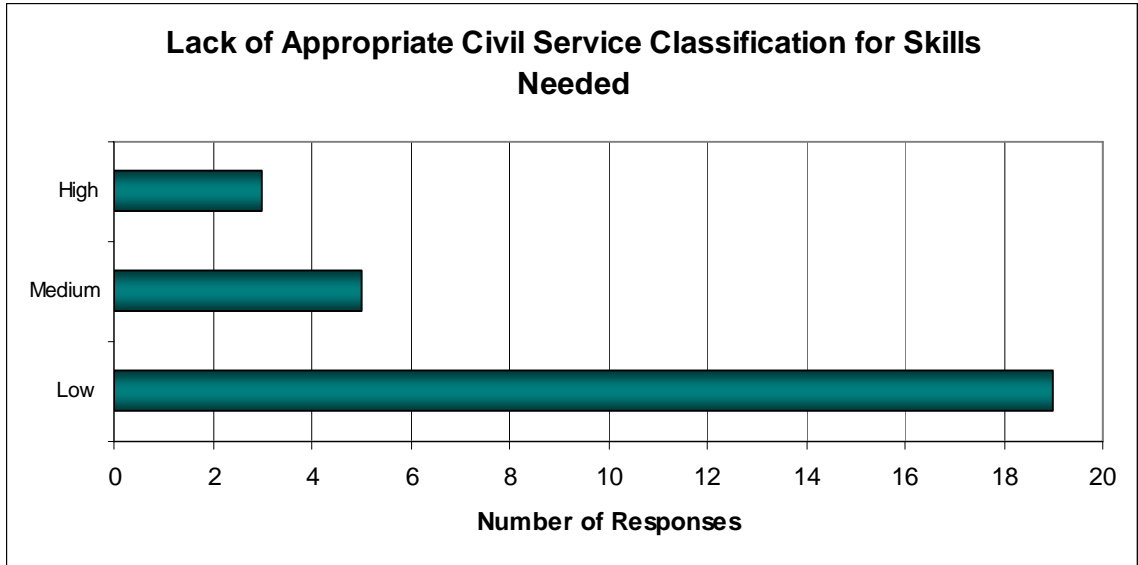
Evaluated together, [Figures 2.11](#) through [2.13](#) indicate a high risk associated with changes in regulations and technology for utilities responding to the survey.

Focusing specifically on recruitment, Figures 2.14 through 2.16 indicate that a lack of an appropriately qualified labor pool poses the greatest risk for utilities maintaining a sufficient number of employees in mission critical classifications, with uncompetitive pay and benefits a second area of risk.



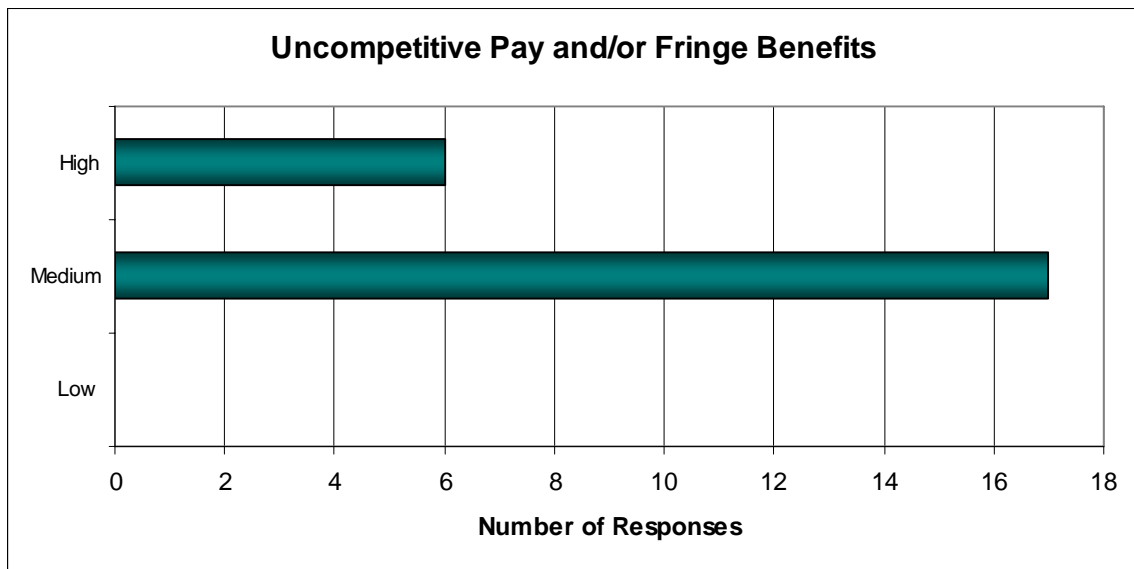
	High	Medium	Low
Number of Responses	29	3	0
Percentage	91%	9%	0%

Figure 2.14. Risk of appropriate qualified labor pool



	High	Medium	Low
Number of Responses	3	5	19
Percentage	11%	19%	70%

Figure 2.15. Risk associated with lack of appropriate civil service classifications



	High	Medium	Low
Number of Responses	6	17	0
Percentage	26%	74%	0%

Figure 2.16. Risk of uncompetitive pay and benefits

ANALYSIS BY CENSUS CODE AND DESCRIPTION

An analysis of the survey data by census code and description further validates the result that Operators and Engineers are the most at-risk positions as shown in [Table 2.1](#). The first column shows census codes as selected by survey respondents for census codes that had 3 or more responses; the second column is the number of entries for each code, and the last column is the position name for that code.

Table 2.1
Positions at risk by census code and description

Census Codes with 3 or more entries:	Number of Entries:	
1	10	Chief Executives
2	15	General and Operations Managers
12	5	Financial Managers
30	3	Engineering Managers
43	19	Managers, All Others
69	6	Waste Management and Remediation Services
73	13	Other Business Operations Specialists
84	3	Financial Analysts
110	3	Network and Computer Systems Administrators
111	3	Network Systems and Data Communications Analysts
135	4	Chemical Engineers
136	24	Civil Engineers
141	5	Electrical and Electronics Engineers
142	13	Environmental Engineers
153	5	Miscellaneous Engineers
155	14	Engineering Technicians
161	3	Biological Scientists
172	7	Chemist and Materials Scientists
620	7	First-Line Supervisors/Managers of Construction Trades and Extraction Workers
632	4	Miscellaneous Construction Equipment Operators
635	18	Electricians
644	7	Pipelayers, Plumbers, Pipefitters, and Steamfitters
700	6	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers
710	15	Electrical and Electronics Repairers, Industrial, Utility, and Transportation Equipment
734	11	Maintenance and Repair Workers, General
735	3	Maintenance Workers, Machinery
761	4	Helpers -- Installation, Maintenance, and Repair Workers
770	14	First-Line Supervisors/Managers of Production and Operating Workers
803	5	Machinists
862	47	Water and Liquid Waste Treatment Plant and System Operators
863	9	Miscellaneous Plant and System Operators

Figure 2.17 shows at-risk positions in descending order of risk as classified by survey respondents. Again, the same top positions are emphasized as being at-risk.

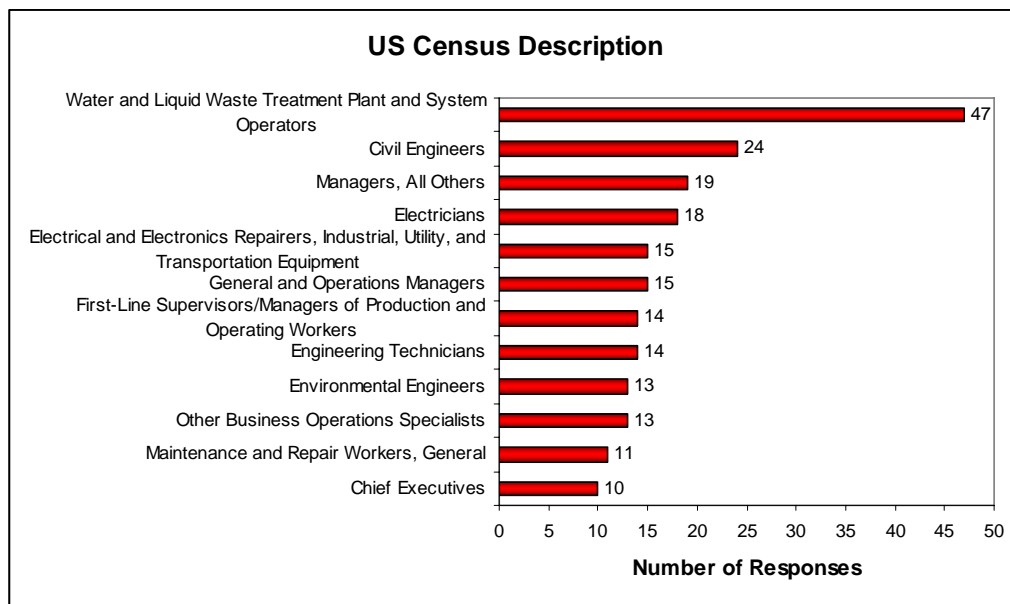


Figure 2.17. Positions at risk by census description

WORKFORCE DEVELOPMENT BEST MANAGEMENT PRACTICES

Across the US, utilities have responded to the shortage of appropriately skilled workers in many different ways. This report captures the best practices that represent actions utilities have successfully implemented to assist them in reaching organizational sustainability with workforce efforts. This material was derived from open-ended responses from the utility survey and best practices shared at the Water Research Foundation Workforce Sustainability collaboration workshop held on November 5 - 6, 2008. Recommendations for further research and for approaches utilities can use at the local, regional and national level are presented in Chapter 6 of this report.

It is important to note that addressing specific elements of workforce planning is like plugging a leak in a pipe. Once one leak is plugged, another may appear. An organization’s approach to workforce planning and development should be focused on creating a pipeline by developing and implementing a comprehensive workforce plan rather than patching holes in the framework.

Creating a Workforce Plan

To create a workforce plan begin by identifying the current state of the organization, define any gaps that exist and determine drivers that will impact your future plans. Successful utilities have followed the path described below.

1. Create a core task force or committee comprised of a small number of cross-functional team members.

2. Develop and conduct an assessment to identify the utility’s needs. The assessment should be developed in the form of a questionnaire and can be administered via pencil and paper or by using online survey software. Once the survey is complete, follow up one-on-one interviews should be conducted to clarify as needed. Assessment questions should focus on:
 - a. Identifying critical positions that accomplish the core business of the organization
 - b. Defining current workforce demographics and retirement projections
 - c. Determining skills and competencies that will be needed in the future
 - d. Learning what training and knowledge resources are currently available
 - e. Identifying existing recruiting, selection and onboarding practices
3. Create a workforce plan that identifies actions to fill the components of the workforce pipeline, from recruiting to fulfillment to retention that aligns with the utility’s strategic business direction.

The assessment and core of the plan should be developed around nine key areas for effective workforce planning as shown in [Figure 2.18](#).



Figure 2.18. Effective workforce planning is developed in 9 key areas

Best Practices by Key Workforce Area

During the Water Research Foundation research project, best practices were identified by participating utilities in survey responses as shown in the following paragraphs. Where available, utility examples presented in the Water Research Foundation workshop are included. For additional details, please see the presentation in this document.

Training and Development

- Conduct a survey (paper based or online) to determine current skill competency levels.
 - **Utility Example:** San Francisco Public Utilities Commission used a three step process to identify current skill competency levels of the water treatment

operators in their regional water system. They began with face to face interviews with other water treatment managers to determine the skill and knowledge needed by staff. From those interviews, the data was analyzed and developed into a confidential survey instrument which was administered online to operators who indicated their degree of confidence in each skill area. Once the survey was complete, the findings were analyzed to determine skill distribution, training requirements and documentation needs. A comparison to the potential retirement dates of the operators was also conducted to determine vulnerability to skill loss resulting from retirement.

- Develop and conduct a training assessment to determine training needs for existing employees. An individual training plan for each employee should be created based on the assessment results
- Develop a learning academy that accommodates technical employee training needs from entry level to senior technician. Approaches include online e-learning, job shadowing, job rotation assignments in addition to standard classroom training.
 - **Utility Example:** EBMUD established key training programs for technical staff. The Water Treatment Trainee Program is conducted over three years which provides for the employee to move up or out of the organization. The first six months of the program involve weekly training sessions which are compensated at the employee's full salary rate. Additional months training are centered around job shadowing and on the job training.
 - **Utility Example:** Union Sanitary District developed a competency based training program for technical workers. Each module defines the skill/competency requirement with standard answers to measure competency level for a specific job. The program is managed by a training coordinator and supervisors or experienced technical staff members certify training completion.
- Provide training programs at worksites to minimize business impact
- Collaborate with local and regional utilities on common training programs
- Develop regional collaborative partnerships with other utilities
- Identify and apply for grants from the Department of Labor that may be used to fund internal education initiatives
- Partner with local community colleges and trade schools to develop and offer an industry focused curriculum
 - **Utility Example:** Colorado Springs formed a partnership with a regional community college to offer a two year degree program taught by adjunct faculty. This program was funded by the college and is supported by grants for special equipment requirements. The objective was to secure a new labor pool of applicants for the utility which has secured approximately 30 applicants. Training targets three applicant pools – high school graduates, career changers and current utility workers seeking skill improvement.
- Form a joint Management/Labor training committee to research, prepare and schedule certification training
- Utilize YouTube www.youtube.com for placement of training videos

Compensation and Rewards

- Optimize job classifications to encompass a broader class series that combines many common classes into a smaller set
 - ***Utility Example:*** Arlington Water Utilities created a program that condensed utility classifications into four bands for Utility Technicians and two bands for Crew Chiefs/ Utility Service Specialists. Each band has a core skill group that must be mastered prior to progressing to the next band.
- Develop a skill based compensation system that rewards career development and skill mastery rather than seniority
 - ***Utility Example:*** Arlington Water Utilities defined a skill based compensation system which encouraged individual and team performance and reduced pay inequity in job classifications within City departments. This allowed employees to leverage their ability to advance and rewards provided for motivated employees.

Workforce/Succession Planning and Continuity

- Develop an agreement with the union to jointly review workforce needs on a regular basis
 - ***Utility Example:*** Union Sanitary District formed a long-term staffing taskforce comprised of management and union officials. Every three years, the taskforce gathers data, conducts an employee survey and focus groups. Recommendations from this effort are then incorporated into the strategic plan. Additionally, the workforce is team-based with employee involvement in hiring and feedback processes.
- Develop an entry level apprenticeship program
- Develop a certified four year apprentice program
 - ***Utility Example:*** JEA developed a four year apprenticeship program which has been certified by the State of Florida. Requirements include 2000 hours per year for each apprentice including a minimum of 144 classroom hours each year. Participants must pass written examinations and field performance examinations and perform rotations through a variety of work assignments.
- Utilize software such as PeopleClick www.peopleclick.com for talent recruiting and selection management

Recruiting and Outreach

- Define and implement an employee referral program to encourage the existing workforce to introduce new candidates into the organization
- Develop and conduct a summer intern program for high school students
- Partner with the local school district for education programs such as tours, career fairs and career academies to educate and attract the future workforce.
 - ***Utility Example:*** The Colorado Springs FUTURE (Fostering Utility Talent Utilizing Relationships in Education) program targets high school students. The training program consists of four phases, is conducted during the student's senior year and counts toward graduation credits. Funded by the utility, this program

includes skill/knowledge assessments and prepares the future workforce for a utility career.

- **Utility Example:** JEA partnered with a four county school district to provide a career academy geared toward educating students on potential careers in the utility industry. Special outreach programs were customized to reach a broad grade range of school children in addition to a summer camp education program.
- Conduct and participate in job fairs
- Use online recruiting sites to advertise open positions
- Use banner ads on the utility website to market careers in the industry
- Become involved in and outreach to community based organizations (e.g. Rotary, local business and professional organizations)
- Establish a strong online presence with a web-based job application system
- Advertise on www.craigslist.com
- Participate in college recruiting events
- Solicit feedback from new hires at periodic stages of the employment process
- Create awareness and “buzz” around the water industry
- Become involved in state and local Workforce Investment Boards (WIBs)
- Develop a relationship with the regional One Stop employment center

Knowledge Retention and Management

- Utilize Sharepoint, Wiki or proprietary software to store institutional knowledge
 - **Utility Example:** San Francisco Public Utilities Commission is designing and implementing a web-based portal as a user-friendly, accessible source of the information employees need to perform their work. They gathered information via surveys and interviews to identify what documents were available, where information was available, where the information was currently stored and in what format, and what information was missing. Key information will be placed on or accessed through the web portal with a variety of ways to search for information (e.g., by organizational unit or using the wiki-style search feature.)

Generational and Cultural Awareness

- Define alternate work schedules
- Partner with the local school district for education programs such as tours, career fairs and career academies to educate and attract the future workforce

Leadership Development

- Develop a learning academy to address leadership and management development needs
 - **Utility Example:** The City of Waco implemented two leadership programs to build their bench strength in the leadership arena. The Leadership Academy provides a strategic overview of the city, how each department contributes to the organization, and observations of how other leaders “lead.” The Supervisor Academy provides a tactical approach to performing as a supervisor by covering

employment law, policy review, budget, benefits, performance management and discipline.

- **Utility Example:** EBMUD offers several leadership development programs. The LEAD Academy prepares journey level O&M staff to become supervisors. LEAD is a voluntary career development program conducted over a 13-week time frame. Each week, eight hours are dedicated to the program by the participant with half of the time being compensated by the employer. The Supervisor Pathways Program prepares experienced supervisors and professionals for superintendent level positions. This is a year long program based on individual development needs and involves six months spent in a different section of the utility. Half of the time spent in this program is compensated by the utility; the other half is conducted on the employee's personal time. The Management Development Program is designed to prepare mid-level supervisors for upper management positions. It is structured similar to the Supervisors Pathways Program.

Career Planning and Management

- Create a customized career and individual development plan for each employee
- Design and implement an employee development program that includes individual and career development planning, coaching and training

Strategy and Measures

- Develop strategies and measures aligned with the strategic business direction of the utility
 - **Utility Example:** Union Sanitary District ties the objective “Maintain a skilled, flexible, team-based workforce” into their balanced scorecard approach.
 - **Utility Example:** EBMUD measures the success of their training programs by monitoring the percent of hires and percent of applicants who enter their leadership programs. The technical skills trainee program is measured on percent of employees who are promoted, currently 100%. Additionally, EBMUD tracks training costs by specific training activity in three categories – general training, technical training and regulatory compliance.

OPPORTUNITIES FOR COLLABORATION

The fourth section of the survey consists of open-ended questions related to opportunities for collaboration. A summary of responses is presented below.

Question 1: Do you have suggestions for collaborative efforts among utilities, with other industries, and/or at the regional and national level?

- Reciprocal training programs and apprenticeships
- Developing training programs with other utilities, educational institutions, local government and community based organizations that could provide a curriculum specific to the water and wastewater industry
- A regional plant operator training program

- Collaboration on position requirements to provide certification at a national level
- A forum for sharing best management practices in key areas such as knowledge management, job design, collective bargaining, and others
- Marketing the water industry as a great career path

Question 2: What external stakeholders (e.g. industry) will benefit most by the water industry's ability to address workforce problems (or be impacted most negatively if they are not)?

- Customers (response provided by nearly every respondent).
- Workforce development boards
- Professional organizations such as AWWA and WEF.
- Local, state and federal governments that hold the public trust.
- Regulators
- Consultants

Question 3: What external stakeholders (e.g. unions, educational institutions, and labor boards) may be able to provide assistance?

- Unions
- Local educational institutions
- Workforce development boards
- Other Utilities
- Private foundations
- Environmental advocacy groups
- Department of Labor
- Local community organizations (Chamber of Commerce, local veterans groups, etc.)

CHAPTER 3

SECONDARY RESEARCH ON COLLABORATIVE INITIATIVES

Secondary research for this project focused on identifying utility and other industry collaborative programs that may serve as models or resources in defining collaborative water sector initiatives. The secondary research was conducted by reviewing research already completed in the water sector, and research in other industries such as the energy, manufacturing and construction sectors to identify collaborations and tools those industries are successfully using to address workforce issues.

The purpose of this chapter is to present and describe a sampling of collaborative initiatives from many sectors of government and industry. Each example is presented through a short paragraph describing the collaboration's purpose and major activities, their website, their funding source(s) – where known – and a description of the types of organizations that are part of the collaboration such as private industry, industry associations, regional workforce boards, educational institutions, and others.

The examples are sorted into the following categories:

- Industry Specific – including manufacturing, engineering, construction, nursing, tourism, and teachers.
- Regional – state, provincial, women, trades/unions
- Utilities
- Public Sector
- National

The sorting is purely for providing presentation categories. The examples provide a diverse set of collaborations that may prove to be beneficial to the definition of a series of water and wastewater sector collaborations.

INDUSTRY SECTOR SPECIFIC

Manufacturing

Type of Collaboration

Regional Associations, Education Institutions, Industry Collaboration

Example Initiatives. *West Central Ohio Manufacturing Consortium (WCOMC).* James A. Rhodes State College has partnered with regional manufacturing businesses, regional community and workforce organizations and other educational partners to assess and develop an advanced manufacturing career pathway in West Central Ohio. The college conducted multiple employer competency needs and skill gap analyses, identified skill gap impacts and training needs, and set in place an advanced manufacturing career pathway that coordinates social, financial and educational services to assist low wage, low skilled residents to obtain education and skills necessary to transition to a high paying, high technology job. The program is divided into three parts or certifications: Basic, Intermediate, and Advanced. <http://www.wcomfg.com> Funded by the Knowledge Works Foundation.

Type of Collaboration

Regional, Private Industry, Education Institution, Economic Council, Workforce Board

Example Initiatives. Greater Phoenix High Technology Manufacturing Future. This study was completed by the Batelle Institute on behalf of Maricopa Community College's Workforce Development Program. Sponsors, Partners, and Supporters include colleges, departments of commerce, economic councils, workforce boards and manufacturing industries and associations. Assessment showed insufficient engineering and technical talent pipeline to meet growth of high-tech manufacturing in the Greater Phoenix region; and the need for "soft skills" in manufacturing. Activities include increasing manufacturing career awareness, targeting outreach and mentoring programs, developing consistent branding, marketing, and communications programs, creating a High-Tech manufacturing Workforce Forum offering international briefings and workshops, strengthening existing programs and curricula and developing new curricula, and establishing a high-tech manufacturing indicator scorecard. <http://www.maricopa.edu/workforce/hightech.php>

Type of Collaboration

Education Institution, Private Industry, Community Workforce Councils

Example Initiatives. Skyline College BioManufacturing Partnership (California Community College System) received a \$700,000 grant to enhance bio-manufacturing education through the Bay Area. This partnership of Genetech, the San Mateo Workforce Development Board and Skyline College is part of the California Community College's support for Industry Driven Regional Collaboratives. Skyline College is:

- Collaborating with bio-manufacturing firms to create an expansive and well coordinated regional industry collaborative
- Working with the Northern California Biotechnology Center and community to build a regional career ladder approach to bio-manufacturing
- Facilitating bio-manufacturing workforce certificate programs throughout the region
- Working with Bio-link to provide training to community college faculty to deliver skill-based certificate programs for dislocated and underemployed workers

Identification of targeted jobs at Genentech is offered, in addition to targeted recruitment and assessment to Genentech standards. The program is coordinated with the San Mateo County Central Labor Council. <http://www.gene.com/gene/about/community/education/initiatives.html>
Funded by Genetech.

Engineering

Type of Collaboration

Engineering Associations, Private Industry, and Teacher/Counselor Organizations

Example Initiative. *Tryengineering.org* is a resource for students (ages 8-18), parents, teachers and school counselors. It is a portal about engineering and engineering careers, designed to help young people better understand what engineering means, and how an engineering career can be made part of their future. Students will find descriptions of the lifestyles and experiences of engineers, and the different disciplines within engineering. Students can participate in hands-on experiments and activities. The site also lists referrals to summer programs and internship opportunities, and provides search tools for schools that offer engineering programs. Useful tips on course selection, applying to university programs and financial aid are included. Parents and educators will find here teaching resources, information about school accreditation, and description of plans, organizations and programs that can be of help in planning and preparing students to develop a future career in engineering. www.tryengineering.org. Funded by IBM, IEEE, SAE International, Try Science, and Sloan Career Cornerstone Center.

Type of Collaboration

National Foundations: WGBH Educational Foundation, National Academy of Engineering, Extraordinary Women Engineers Coalition

Example Initiatives. *Engineer Your Life website.* In 2004, members of the engineering community formed a coalition to encourage academically prepared girls to enroll in engineering programs. After extensive research revealed some of the reasons girls were not interested in pursuing engineering, the coalition developed and tested new messages that emphasized how varied and creative engineering can be and what a difference engineers make in the lives of others. The messages—creativity has its rewards, explore the possibilities, and make a world of difference—are now part of a national campaign designed to encourage college bound girls to explore engineering. The Engineer Your Life Web site is the centerpiece of the national campaign, and is meant for high school girls and the adults in their lives (parents, counselors, teachers, and other educators) who want to learn more about what life and work are like for engineers. The campaign will:

- Introduce high school girls to young women engineers who embody these messages
- Showcase engineering careers and illustrate that an education in engineering is both desirable and within their reach
- Help school counselors and teachers better understand engineering and give them the resources and training they need to advise students
- Mobilize America's more than one million engineers with compelling resources, training, and messages to use in their ongoing outreach efforts. www.engineeryourlife.org

Funded by the National Science Foundation, Northrop Grumman Foundation, The Stephen D. Bechtel, Jr. and United Engineering Foundation.

Construction

Type of Collaboration

Private Industry, Industry Associations and Education Institutions

Example Initiatives. *National Center for Construction Education and Research (NCCER)* is a non-profit education foundation created in 1996 to develop standardized construction, maintenance, and pipeline curricula with portable credentials and help address the critical skilled workforce shortage. Their training process includes accreditation, instructor certification, standardized curriculum, national registry, assessment and certification processes. The site includes model practices that demonstrate exemplary and replicable qualities for local construction education. *Build Your Future* is another component of NCCER that sponsors a Career In Construction Week as an educational and recruitment tool. www.nccer.org. Initial funding provided by private contractors and manufacturers. Funding is by sponsorship from private industry and associations.

Type of Collaboration

Private Industry and Industry Associations

Example Initiatives. *Constructmyfuture.com* is a website dedicated to educating students, parents and teachers about opportunities in the construction industry. The site presents information describing jobs in the industry, education required, videos and other resources to assist teachers, interactive games, assessments and quizzes to evaluate one's aptitude for the construction industry, a great deal of information about significant construction projects completed throughout history, and much more and of course links to relevant sites. www.Constructmyfuture.com. Funded by the Associated General Contractors of America, The AED Foundation (an associate of Associated Equipment Distributors) and Association of Equipment Manufacturers.

Nursing

Type of Industry

Private Industry

Example Initiatives. www.campaignfornursing.com and www.discovernursing.com are sites sponsored by Johnson and Johnson to recruit nursing candidates.

Tourism

Type of Collaboration

National Industry Associations, Private Industry

Example Initiatives. *Discover Tourism* launched by the Canadian Tourism HR Council in partnership with a private Toronto based business and endorsed by the Hotel Association of Canada, brands the industry as an attractive option for young income seekers, young career seekers, people with disabilities, older workers and new Canadians. Their approach is to identify the target employee and treat them as a potential customer.

Teachers

Type of Collaboration

State Association, Educational Institutions

Example Initiatives. *The Center for Education Recruitment, Retention, and Advancement (CERRA)* was created to identify, attract, place and retain well-qualified teachers in the state of South Carolina. Their agenda is to increase the number of students in the education pipeline and recruit and retain certified teachers. Their target groups are middle and high school students, college students, and adults interested in changing careers. Some methods include a teacher job bank for advertising positions and locating candidates and includes information about teacher salaries in South Carolina, shortage areas, and initial certification requirements. www.cerra.org. Funded by South Carolina Commission on Higher Education.

Type of Collaboration

State Department of Education, multiple Universities and Educational Organizations

Example Initiatives. *TEACH California* is a Web site administered by the California Department of Education (CDE). The site was created with the understanding that California faces a great shortage of special education, mathematics, and science teachers. The site is designed to explain the teacher preparation process, assist prospective teachers in creating their plan to become credentialed teachers, and offer links to important resources. www.teachcalifornia.org.

Type of Collaboration

US Department of Energy, Educational Institutions, Private Industry

Example Initiatives *Workforce Development for Teachers and Scientists (WDTS)* provides a continuum of opportunities to the Nation's students and teachers of science, technology, engineering and mathematics (STEM). Programs include undergraduate internships, programs for teacher skill development, programs for K-12 students, and joint faculty-student programs. They also sponsor the National Science Bowl, a nationwide academic competition that tests students' knowledge in all areas of science and the Real World Design Challenge (RWDC), an annual event that provides high school students, grades 9 – 12, the opportunity to work on real world engineering challenges in a team environment by addressing a challenge that confronts one of our nation's leading industries. http://www.scied.science.doe.gov/scied/sci_ed
Funded by US Department of Energy.

Type of Collaboration

National Industry Association

Example Initiatives *The Retail Council of Canada* has created grass roots and public relations efforts such as scholarships to post-secondary retail education programs, sector-specific hiring fairs, and press releases aims at positioning retail as a desirable career choice. www.retailcouncil.org

REGIONAL

State

Type of Collaboration

State Department of Transportation, Educational Institutions

Example Initiatives. *New York State Youth Construction Initiative Program (YCIP)*. This is a high school to work program designed to increase the number of women and minorities in construction-related occupations, particularly in highway construction. It is a 2 year program with 3 core components: in-school curriculum, mandatory workshops, and an annual 6 week summer work experience. www.albany.edu/cuyt/YCIP. It is funded collaborative with the New York State Department of Transportation and the University of Albany, State University of New York.

Type of Collaboration

Construction Industry Associations, Educational Institutions, Private Industry

Example Initiatives *Oregon Building Congress (OBC)*. This organization creates and oversees school to career programs in Portland, Eugene, Medford, and Klamath Falls. Two of the best practices are:

- *Math Summer Workshops* that educate math and science teachers about the skills needed to be successful in the construction industry by giving teachers hands-on experiences.
- *Construction Academy* provides hands-on construction experience to students by showing them how math, science, and other academic subjects are applied in the construction industry during a five week summer school rotating apprenticeship training center (younger students) or an eight week construction project on public land (older students). The objective is to learn what it takes to be an employable worker such as calculating, writing, speaking, listening, problem solving, taking responsibility, and becoming a team player.

www.obcweb.com. Membership fee based, tiered fees.

Type of Collaboration

Alaska & US Department of Labor, Unions, Community Organizations

Example Initiatives. *Alaska Works Partnership*. This is a nonprofit organization that connects men, women, displaced workers, veterans, with high-paying careers in construction

through apprenticeship outreach and construction apprenticeship preparation and mentoring. They use classes, hands-on experience, and exposure to various trades to teach the technical and physical skills needed to work in the skilled trades. Participants receive college credit in Construction Math and attend classes in job readiness skills and physical conditioning in addition to exposure to carpentry, electrical, plumbing, operating and sheet metal trades. www.alaskaworks.org

Type of Collaboration

Private Industry, State and Local Workforce Boards, Educational Institutions, Energy Utilities and Associations

Example Initiatives. *The Employ Florida BANNER Center for Energy* is a partnership of industry, education, and Florida Workforce Development. It is one of ten BANNER centers created by Workforce Florida to provide curriculum, training and support to develop employees for targeted industries in the state, in this case, to meet the current and future workforce needs of utility companies in Florida. The focus of the energy BANNER center is to recruit and train line technicians and eventually power plant operators and maintenance workers in the power generation and distribution sector. The organization recruits, assesses, trains, and places workers at the entry level and provides advanced training for incumbent workers.

The organization assists to:

- Provide resources for utility education and training in Florida
- Promote energy related career opportunities
- Develop articulation strategies for high wage, high skill occupations
- Facilitate ongoing communication between energy providers in Florida
- Bring together industry, education, economic development and workforce entities to help meet identified needs with shared problem solving
- Provide a forum for electric utilities to address current and emerging issues and to share best practices related to workforce development

Lake-Sumter Community College was selected as the site for the BANNER Center for Energy due to already existing programs to train electric utility workers, particularly in electrical distribution training. Currently the BANNER Center partnering to provide the previously established curriculum for distribution while expanding curriculum for other industry positions. http://www.workforceflorida.com/banner_center_energy. Funded by a grant from Workforce Florida, Inc. Funding has also been established for a BANNER Center for the Water Sector in the amount of \$500,000. WFI worked with a collaborative group of utilities and water associations representing the water sector in Florida to create a proposal for the establishment of the Center.

Provincial

Type of Collaboration

Municipalities, Educational Institutions, Private Industry, Economic Development Organizations

Example Initiatives. Central Alberta Economic Partnership. The Central Alberta Economic Partnership is a coalition of 39 central Alberta municipalities and 11 business, education and economic development organizations organized to enhance sustainable economic prosperity across Central Alberta by harnessing the collective interests of communities, business and government. *The Regional Labour Force Working Group* was formed in 2004 to coordinate an approach to labour force development in Central Alberta. Their key focus areas are education and training, encouraging labour force participation, communication and program support and recruitment and retention. Partnerships are in place with local colleges to provide skilled workers in key industries such as the meat industry, truck driving, rig technician, and human resources in manufacturing and agri-business. They have initiated a series of employer fairs focused on youth and aboriginal employment. The group is focused on recruiting out of province and foreign workers to Central Alberta through advertising in rural newspapers, creating a foreign worker internet site and on-line job fair, and conducting foreign worker readiness sessions with employers. www.centralalberta.ab.ca.

Women

Type of Collaboration

Community Police Departments

Example Initiatives. Recruiting Woman Police Officers. The Albuquerque and Tucson Police Departments collaborated to increase the number of female and minority recruits in the Academy through use of the following strategies:

- Assessing current recruitment practices
- Developing a strategic marketing plan (which included a web recruiting page featuring women and minorities and Internet advertisements)
- Hosting a women and policing career fair
- Obtaining free positive media coverage for the career fair and the police department (this was the #1 strategy for effective recruitment)
 - Human interest news stories on female officers linked to job openings
 - PSAs on TV and radio with female officers featured
 - Female officers on talk shows as guests
- Developing flyers, posters and brochures featuring female officers

Recruitment sources included gyms, sports teams, outdoor clubs, outing stores, martial arts schools, women in the Army Reserves, military bases, ROTC, Aviators, gun clubs, EMTs/Firefighters, women's bookstores, supermarkets, Laundromats, shopping malls, community centers in minority neighborhoods, associations for Hispanics, and Native Americans.

Type of Collaboration

Unions, Community Organizations, Educational Institutions, Workforce Development Boards

Example Initiatives. Hard Hatted Women. This Cleveland based organization offers a 10 week Pre-apprenticeship training program which is a job readiness program designed to prepare women for jobs in non-traditional blue-collar fields, especially in the skilled construction trades. They utilize classes, hands on construction experience, and exposure to teach the mental and physical skills needed to work in the skilled trades. www.hardhattedwomen.org

The organization is funded through a diverse mix of resources, including government and foundation grants; individual, union and corporate donations; fee for service; and membership dues.

Trades/Unions

Type of Collaboration

Unions, Utilities

Example Initiatives. The International Brotherhood of Electrical Workers (IBEW) is collaborating with utilities to jump-start training of next generation workers by creating a joint union-utility trust fund to finance training of new workers and sharpen skills of exiting employees. The partnership expects five centers in Arizona, Florida, Kansas, Michigan and Washington by the end of summer 2008. The coursework will provide the skills needed by prospective employees who would go work for a utility, as well as screen applicants for their appropriate fit in different roles. (www.energycentral.com/centers/energybiz/ebi)

Type of Collaboration

Community organizations, middle and high schools, Private Industry and Associations

Example Initiatives. Northern New England Tradeswomen. This organization creates multiple learning opportunities for girls and women interested in exploring the trades or technical fields. They offer multiple programs such as a three week long trades exploration program for girls in 5th – 8th grades that seeks to build self-esteem, physical confidence, interpersonal cooperation and leadership skills. They also offer programs focused on hands-on carpentry, physical challenges and other trades experiences. www.nnetw.org Partially funded by United Way and donations.

Utilities

Type of Collaboration

Private Industry, Educational Institutions, Workforce Investment Boards

Example Initiatives. Power Pathway is a 12 week program offered at Pacific Gas and Electric to bring more workers into the skilled crafts and trades. The utility provides expertise and training to create qualified workers, with the potential of employment at the end. Community colleges provide facilities and their expertise in teaching courses such as English and math.

Community-based organizations such as workforce investment boards identify qualified candidates and help shepherd them through the process.
www.pge.com/about/careers/powerpathway.

Type of Collaboration

Utilities, Unions, Educational Institutions, Workforce Development Councils

Example Initiatives. *The Center of Excellence for Energy Technology* at Centralia College in Centralia, Washington serves as a resource for utilities' workforce development programs and coordinates programs at six Washington community colleges that train workers for utility industry jobs. Industry executives serve on the Center's advisory board and help design curriculum based on utilities' needs and set skill standards for power generation jobs. The local IBEW participates on the advisory board and provides subject matter expertise for setting power generation skill standards. The Center has become a recruiting site for utilities in the state.
www.centralia.edu/coe.

Type of Collaboration

Investor-owned Electric Utilities

Example Initiatives. *The Edison Electric Institute's Center for Workforce Development* was established to provide a more comprehensive approach to workforce development and identify and replicate the best practices of community colleges, high schools and apprenticeship programs. It also aims to improve the perception of energy utility careers, anticipating an increase in hiring – beyond just replacement needs – over the next 5 to 10 years.
www.eei.org/about_eei/index. Funded by the Edison Foundation.

Type of Collaboration

Utilities, Educational Institutions

Example Initiatives. Kansas City Power & Light initiated a program with other utilities at a local community college to develop utility workers. In collaboration with Aquila, Westar Energy, Platte-Clay Electric Coop and the Metropolitan Community College Business & Technology Campus KCPL launched a two year Kansas City Line School at Metropolitan Community College. The program targets linemen providing 400 hours of internship. After graduation, some students advance to KCPL's six week pre-apprentice training and apprentice training then vie for positions as full-time linemen. The program targets participants that represent the demographic diversity of the community.

Type of Collaboration

Utility, Workforce Development Board, Educational Institutions

Example Initiatives. *DeKalb Workforce Development and Georgia Power.* This is a collaboration to offer graduating seniors an opportunity to explore the Electrical Line Worker Apprentices Program which prepares them for entry level employment with Georgia Power. Areas of study include physical science, mathematics, safety, work ethics, communication, problem solving, tools and equipment usage and fundamentals of electricity. Eight students completed the program in 2007 and were offered employment with Georgia Power. www.dekalbworkforce.org.

Type of Collaboration

Economic Councils, Private Industry, Public Service Organizations

Example Initiatives. *Greater Houston Partnership's (GHP) Energy Collaborative Workforce Committee.* The mission of this group is to engage industry, education, economic development and community partners to work together to meet current and future energy workforce needs. They identified four strategies to accomplish this:

- Leverage best practices (created a template to track these)
- Build industry and career awareness (they are creating a members-only website theworksource.org)
- Accelerate pathways and programs for entry and continuous learning in energy (they are collecting information on all available energy training/educational opportunities in the greater Houston area such as the Offshore Energy Center, API, BP, Shell, and 6 universities in the geographic area)
- Collaborate for win-win solutions

This group is still completing foundational work by moving forward with specific action-oriented collaboration events, creating strategic partnerships to leverage resources and results, identifying and tracking metrics, and providing input to the Energy Collaborative ten year plan.

Some activities conducted or planned for 2008 include a science and engineering fair, an “Energy City of the Future” Competition to challenge students to design innovative plans for Houston’s energy use in 2050, a series of field trips to encourage interest in Earth Sciences, a youth to energy summer camp, and an Academy of Petroleum Exploration & Production Technology to increase student awareness of the energy and career opportunities.

<http://www.houston.org/committees/detail.asp?committee=HOUENERGY>. Funded through fee based membership.

Type of Collaboration

Utilities

Example Initiatives. *Bay Area Forum, Workforce Development Task Force.* The purpose of this task force is to help Bay Area water and wastewater utilities develop cost-effective investment strategies for addressing workforce development challenges. The task force was established as part of a Water Research Foundation project, Bay Area Water Utilities Operations Collaborative: Model for Inter-Regional Utility Cooperation. This project is jointly funded by Water Research Foundation, San Francisco Public Utilities Commission, Santa Clara Valley Water District, East Bay Municipal Utility District, and Contra Costa Water District.

The project has also had the benefit of a West Coast Water Utilities Workshop on Workforce Development, held in May of 2008 which was attended by 15 utilities and representatives of the education, energy and labor sectors. The task force has identified 5 mission critical job classifications (electrician, electronic maintenance technician, machinist, water treatment operator and wastewater treatment operator), and has established two subcommittees to address complementary goals: Expanding the labor pools for mission-critical job categories, and improved use of technology to support workforce development activities. Strategies are being analyzed in terms of economic, environmental, and social costs and benefits. The Chair of the Task Force is Cheryl Davis, Manager of the San Francisco Public Utilities Commission's Workforce Development Initiative. Cheryl can be reached at ckd@swater.org.

Public Sector

Type of Collaboration

Government Organization

Example Initiatives. *ICMA Next Generation Strategy.* This is a strategy created by the International City Manager Association to promote interest in public sector careers and encourage interest in managerial and executive positions. Activities include

- NextGen website
- Conference activities
- Local government management fellowship
- Local government management internship
- Executive recruiter summit
- Cal-ICMA coaching initiative
- Collegiate public service fairs

www.icma.org/netgen. Funded by membership fees.

National Collaborations

Type of Collaboration

Private Industry, educational institutions, public utilities, unions

Example Initiatives. *The Center for Energy Workforce Development and Get Into Energy.* The mission of CEWD is to “build the alliances, processes, and tools to develop tomorrow’s energy workforce.” The Center for Energy Workforce Development (CEWD) was created as a non-profit consortium of electric, natural gas and nuclear utilities to help utilities work together to develop solutions to the workforce shortage in the utility industry. CEWD has teamed with secondary and post secondary education institutions and the International Brotherhood of Electrical Workers to tap into industry apprenticeship programs. CEWD’s approach is to develop industry solutions with guidance from an Advisory Council of Experts; these solutions can be tailored by regional teams to address economic and geographical differences.

A highly visible activity sponsored by CEWD is the www.getintoenergy.com website which is geared to educate students, parents, and teachers about careers in the energy industry. This highly interactive website provides videos of energy workers in the field doing their job, games and assessments to determine one's aptitude for a career in the energy field, locations of training programs, and many links to energy sector websites that provide learning opportunities for students.

Additionally, CEWD conducts an annual workforce development survey to identify areas of worker shortage, sponsors regional forums on partnerships and regional/state solutions to workforce issues, defined an energy competency model, developed communication templates for branding purposes, and developed solution guides to help CEWD members apply best practices in their organizations. Membership allows access to numerous toolkits, survey results, and more that can be applied to the member's workforce development program. www.cewd.org or www.getintoenergy.com. Member funded with a sliding fee scale.

Type of Collaboration

Private Industry, Educational Institutions, Youth Service Organizations, Professional Associations

Example Initiatives. *Wisconsin and Maui Economic Development Board Women in Technology Project.* This is a partnership of the University of Wisconsin, Women in Technology, and the Maui Economic Development Board to encourage women and girls in rural areas into science, technology, engineering and math (STEM) fields (funded by the USDA). This project is a partnership of industry, educational institutions, government agencies and youth-serving organizations that is using approaches such as job shadowing, career days, science camps, mentoring, apprenticeships and training designed to engage female students from middle school through college. Mentoring is a key engagement strategy and the project is using MentorNet, a mentoring program that links undergraduate and graduate students with professionals in the industry, government and higher education. Initial outreach for the program is through selection of students from 16 rural schools to take part in two weeks of an intensive STEM experience at the university which familiarizes the students with this unknown area (STEM).

The first phase of the grant has been spent on networking community colleges, universities, Girl Scout councils, industry, professional women's organizations, and others. Seed grants are provided to help universities and organizations develop programs and funding sources to sustain STEM initiatives.

Use of role models is key to girls fostering a vision of themselves as engineers and scientists. Funded by US Departments of Labor, Education and Agriculture.

CHAPTER 4 FUNDING

FUNDING SOURCES

Across the country, there are many different pathways by which funding can be acquired to launch a workforce development program. Many of the largest companies in the United States have established philanthropic foundations dedicated to supporting programs in their community through grant contributions to programs that benefit society. While many of these groups have programs dedicated to certain topics (health care, disadvantaged children), many of them have programs dedicated to the improvement of science, technology, engineering and math (STEM) programs at many different educational levels. There are also many programs dedicated to helping displaced workers obtain new jobs, providing education to minorities so they can establish themselves in a stable career, and assist young adults who might not choose college as their career path in identifying an alternative career. These different funding programs can be tapped to assist with the creation of well-rounded workforce development programs. [Table 4.1](#) presents a description of some of the grant opportunities available across the United States. The following details are provided in the table:

- Name of the grant foundation
- Website
- Purpose of the foundation, or a description of the relevant funding program that would be relevant to the creation of a workforce development program
- Eligibility requirements (if available)
- Information on past grant recipients and descriptions of past projects that had received financial support (if available)

Table 4.1
Grant opportunities for workforce development programs

Foundation	Description	Eligible Groups	Past Projects/Grant Recipients
Alfred P. Sloan Foundation www.sloan.org	Funding program is "Education and Careers in Science and Technology." Funds programs to strengthen education in science and technology, to increase interest in these fields, and to understand and communicate to others the nature of careers in these fields.	Tax-exempt, non-profit organizations	<ul style="list-style-type: none"> • Support a study on the availability and adequacy of workplace flexibility information for aging workers • Assist community colleges with the development of online courses for part-time learners • Support a national initiative to accelerate large-scale adoption of on-line training for low-wage workers
	Funding program is "Science and Engineering Workforce." Funds efforts to establish and assemble the basic facts about the U.S. labor market and workforce in science and engineering, including temporary workers, graduate students, postdocs, and part-time/adjunct faculty.	Institutions of higher education and research	<ul style="list-style-type: none"> • Gender & Racial Patterns in the Attainment of a Science/Engineering Baccalaureate • Underrepresented Undergraduates in STEM: From Matriculation to Degree Completion at Large, Research-Intensive, Public Universities
National Science Foundation www.nsf.gov	Funding program is "Education and Human Resources." The goal of this program is to achieve excellence in U.S. science, technology, engineering and mathematics (STEM) education at all levels in order to support the development of a diverse and well-prepared workforce of scientists, technicians, engineers, mathematicians and educators and a well-informed citizenry that have access to the ideas and tools of science and engineering.	Universities and Colleges; Non-profit, non-academic organizations; For-profit organizations; State and Local Governments	<p>Recipients of grants in the Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) include Penn State University, University of South Florida, Cabrillo College, Central Virginia Community College, and Maricopa County Community College District</p> <p>Recipients of grants in the Math and Science Partnership (MSP) program include Merck Institute for Science Education, Institute For Advanced Study, University of Arizona, American Society of Human Genetics, and University of Wisconsin-Madison</p>
Northrop Grumman Foundation www.northropgrumman.com/community/foundation.html	The Foundation supports education opportunities to the nation's youth, with a priority of providing assistance to literacy, science, technology, engineering and math (STEM) programs spanning pre-college through collegiate levels.	Tax-exempt, non-profit organizations	Not provided

(continued)

Table 4.1 Continued

Foundation	Description	Eligible Groups	Past Projects/Grant Recipients
United Engineering Foundation www.uefoundation.org	The Foundation advances the engineering arts and sciences for the welfare of humanity by supporting engineering and education programs.	Tax-exempt, non-profit organizations	<ul style="list-style-type: none"> • ASCE for continuing support of the Extraordinary Women Engineers Project, a coalition of partnering societies, academic institutions and others • WGBH to support the development of Season II of DESIGN SQUAD, a Public Broadcasting System engineering television series targeted to 9 to 12 year olds and designed to attract kids to engineering • AIME, with ASCE, ASME, and AIChE as partners, to create a curriculum for an Emerging Leaders Institute, establish an online community and present a pilot offering
Levi Strauss Foundation www.levistrauss.com/Citizenship/LeviStraussFoundation.aspx	Funding programs include those that alleviate poverty among women and youth, including focusing on building assets in the community. The Foundation collaborates with other institutions to fund innovative programs that help break the cycle of intergenerational poverty.	Tax-exempt, non-profit organizations	<ul style="list-style-type: none"> • Council for Adult and Experimental Learning: To support a demonstration project to test the Livelong Learning Account Program as a way to help low-wage health care workers pay for education and training to advance their careers • Young Entrepreneurs at Haas: To provide strategic planning and program support to help under-served youth achieve higher education and economic self-sufficiency goals
Morgan Family Foundation www.morganfamilyfoundation.org	The Foundation supports efforts to expand educational opportunities at all levels including programs that: <ul style="list-style-type: none"> • Motivate students to achieve and gain the skills that allow them to reach their academic and career goals, including vocational training • Encourage girls and young women to prepare for and achieve careers in math, science and technology 	Details not provided	<ul style="list-style-type: none"> • Foundation for a College Education; Palo Alto , CA; General Support • Illinois Institute of Technology; Chicago, IL; Base of Pyramid Success Project • Earn While You Learn, Krause Center for Innovation at Foothill College: General Support
Annie E. Casey Foundation www.aecf.org	The Foundation funds programs that address public policies, human-service reforms, and community supports that more effectively meet the needs of today’s vulnerable children and families.	Organizations need to be vetted by funding intermediary	<ul style="list-style-type: none"> • Jobs Initiative - Eight-year effort in six cities to connect inner-city young men and women to family-supporting jobs in the regional economy and to improve the way urban labor market systems work for low-income, low-skilled workers.

(continued)

Table 4.1 Continued

Foundation	Description	Eligible Groups	Past Projects/Grant Recipients
Ford Foundation www.fordfound.org	The Workforce Development Program provides grant for projects that: <ul style="list-style-type: none"> • Transform labor market dynamics through collaborations with employers to modify worker recruitment, training and promotion • Encourage public policies and employer practices that improve the quality and pay of jobs for low-wage working families • Promote regional economic development that links economic growth to improved employment opportunities for low-income people 	Undefined	<ul style="list-style-type: none"> • Colorado Community College System Foundation: For research on community college programs serving low-income students • East Harlem Employment Services, Inc.: Core support for STRIVE National to provide technical assistance and other services to its affiliates and to assess the feasibility of expanding the STRIVE Program • Jobs for the Future, Inc.: For technical support to and evaluation of local funder collaborative organized to support workforce development partnership efforts
Hitachi Foundation www.hitachifoundation.org	The Foundation funds programs that focus on improving the ability of economically isolated people to work, earn living wages, and/or accumulate assets. Benefit of funded projects should include expanding work, wages, and savings/assets of low-wage workers.	Tax-exempt, non-profit organizations	<ul style="list-style-type: none"> • New Orleans Jobs Initiative: To improve the retention and upward mobility of workers by building or strengthening partnerships with businesses in key sectors - including shipbuilding, food processing and packaging, and health care. NOJI will expand its primary focus from pre-employment and pre-training preparation for job seekers to offer customized training packages with individual companies and key sectors
Rockefeller Foundation www.rockfound.org	Funded program within the Foundation includes the Campaign for American Workers, which works to reinforce American workers' social and economic security, reimagining the regulatory framework that governs our economy, and reinvigorate the notion of citizenship.	Mainly tax-exempt, non-profit organizations but some other organizations are eligible	<ul style="list-style-type: none"> • Human Services Coalition of Dade County: in support of research to assess, analyze and identify gaps and opportunities in federal and state investments in Florida's workforce development system, and to produce a report of recommendations to facilitate improvements in state workforce programs • Workforce Alliance: for general support of its mission to raise awareness about policy and program options for the education and training of low-skilled, under- and unemployed workers

(continued)

Table 4.1 Continued

Foundation	Description	Eligible Groups	Past Projects/Grant Recipients
W.K. Kellogg Foundation www.wkkf.org	Funding program is the “Family Income and Assets Program.” The focus of this program is to build sustainable, multi-generational financial independence for vulnerable and low-wealth families through sustained income generation and asset accumulation that increases economic opportunities, options, and choices for current and future generations; specifically identifying and investing in education and workforce development leading to high-wage career opportunities.	Tax-exempt, non-profit organizations	<ul style="list-style-type: none"> • Cornerstone Alliance: address local workforce development needs as identified by area employers and train and place program graduates in jobs with a livable wage • Illinois Institute of Technology: generate new ideas for a workforce system that connects the market needs of business with the skills of out-of-school youth
MetLife Foundation www.metlife.com	The Foundation focuses on strengthening the quality of education by supporting initiatives that: <ul style="list-style-type: none"> • Promote access and opportunity to schooling, including a focus on diversity and inclusion • Create connections between schools and communities to encourage shared understandings 	Tax-exempt, non-profit organizations	<ul style="list-style-type: none"> • Provides support for the National Commission on Teaching and America's Future (NCTAF) to examine the needs of 21st century students and the implications for teacher preparation, the ongoing development of career teachers and the conditions necessary for strong schools. • Jobs for the Future administers the MetLife Foundation Community College Excellence Awards to recognize outstanding two-year institutions that exhibit model student support services and innovative approaches to encourage academic success
Prudential Foundation www.prudential.com/view/page/12373	The Foundation provides grants focusing on: <ul style="list-style-type: none"> • Education – Supports initiatives that strengthen public education including improving leadership skills for education stakeholders and providing opportunities for arts education and youth development programs • Economic Development – Supports initiatives that increase employment opportunities by strengthening job skills and creating jobs through business development. Programs involve workforce development and increasing entrepreneurship through training 	Tax-exempt, non-profit organizations	Not provided

(continued)

Table 4.1 Continued

Foundation	Description	Eligible Groups	Past Projects/Grant Recipients
<p>Charles Stewart Mott Foundation www.mott.org</p>	<p>Funding program is “Expanding Economic Opportunity.” The program has the goal of expanding opportunity for those in, or at risk of, persistent poverty by promoting policies and programs that increase income security, help people connect to the labor market and enable them to advance into better-quality, higher-paying jobs.</p>	<p>Tax-exempt, non-profit organizations</p>	<ul style="list-style-type: none"> • Workforce Project for Young Veterans: provide support to implement an action plan to address the employment and workforce development needs of young veterans • Alternative Staffing Outcomes for Job Candidates and Employers: provide funds to analyze and document the job placement outcomes for clients of four alternative staffing organizations, including a comparison with hard-to-employ clients of conventional staffing firms
<p>U.S. Department of Labor www.doleta.gov</p>	<p>Example funding programs include:</p> <ul style="list-style-type: none"> • Women in Apprenticeship and Nontraditional Occupations (WANTO) Grants: Assisting employers and labor unions in the placement and retention of women in apprenticeship and nontraditional occupations • Technology-Based Learning (TBL) Initiative: Expand access to training resulting in an increased number of workers trained, particularly in high-growth, high-demand occupations, and to meet the needs of industry for skilled employees • WIRED Initiative: Stresses the role of talent development in creating effective regional economic development strategies. Awarded \$15M to 13 regions that face various challenges in economic growth and sustainability as first project funding. 	<p>Varies by grant; may need to be part of a consortia; some are available for individual non-profits</p>	<ul style="list-style-type: none"> • High-Growth Job Training Initiative Grants for the Energy Industry and Construction and Skilled Trades in the Energy Industry • Mentoring, Educational, and Employment Strategies to Improve Academic, Social, and Career Pathway Outcomes • Office of Apprenticeship and the Women’s Bureau; Women in Apprenticeship and Nontraditional Occupations (WANTO) Grants • Community-Based Job Training Grants • Economic development for challenged geographic areas.

(continued)

Table 4.1 Continued

<p>U.S. Department of Education www.ed.gov</p>	<p>Relevant program offices are Office of Vocational and Adult Education and Office of Postsecondary Education. Example programs include:</p> <ul style="list-style-type: none"> • Strengthening Institutions Program (SIP): Helps eligible educational institutions become self-sufficient and expand their capacity to serve low-income students by improving and strengthening the academic quality, institutional management, and fiscal stability of eligible institutions • Minority Science and Engineering Improvement Program: Assists predominantly minority institutions in effecting long-range improvement in science and engineering education programs and increasing the flow of underrepresented ethnic minorities, particularly minority women, into science and engineering careers 	<p>Varies by grant; may need to be part of a consortia; some are available for individual non-profits</p>	<p>Past recipients include many different state agencies and universities across the country. Also, many community colleges received grants for vocational programs and minority-enrollment programs</p>
<p>U.S. Environmental Protection Agency www.epa.gov</p>	<p>Environmental Education Division (EED), Office of Children's Health Protection and Environmental Education, supports environmental education projects that enhance the public's awareness, knowledge, and skills to help people make informed decisions that affect environmental quality.</p>	<p>Must be a state or local education or environmental agency, college or university, non-profit organization, or tribal education agency</p>	<ul style="list-style-type: none"> • Idaho Environmental Education Association: Project will increase the environmental education capacity in the state by providing leadership development and strategic planning • Chicago Academy of Science: Program provides underserved and minority students in Chicago public high schools with opportunities to increase knowledge in environmental science and gain exposure to careers in environmental research, conservation, and education • Audubon Society: The Women in Science Institute addresses career development by introducing girls ages 11 through 14 to the various careers in science

COLLABORATIVE MODELS

There are two different models for funding collaboratives that are commonly used by organizations in the creation of workforce development programs. One of the models is based on obtaining funding from state and local government organizations. In this model, various groups come together to form a collaborative with the goal of obtaining funding from the state and local level Workforce Investment Boards that are funded by the US Department of Labor. The second widely utilized model includes developing a similar collaborative, however this group focuses on creating and obtaining funding from a private funding collaborative. The funding collaborative could be made up of private investment groups or private foundations such as those listed in [Table 4.1](#). Both of these models are discussed in more detail in the following chapters. It should be noted that in some circumstances, a workforce development program could be created using funds from both government and private organizations.

Public Partnerships

In 1998, the National Workforce Investment Act was signed into law. This Act provided the framework for a national workforce preparation and employment system designed to meet both the needs of the nation's businesses as well as the needs of job seekers and those who want to further their careers. For water utilities, the most relevant portion of the Act was Title I, which authorized the new Workforce Investment System. As part of this program, workforce investment boards were established at the state level and each state was responsible for developing a five-year strategic plan related to workforce development. Local "workforce investment areas" were established by each governor, who would also provide oversight for local workforce investment boards. The purpose of the workforce investment boards is to provide guidance at the state and local levels on workforce training and education policy. Also required by the Act was the creation of youth councils to guide the development and operation of programs for youth, as well as "One-Stop" career centers to be located in neighborhoods so local citizens can access core employment services and be referred directly to job training, education, or other services.

After the state and local workforce investment boards were established, they became eligible to receive funding from the Department of Labor and disseminate it to local organizations that could help implement the provisions of the Act. The Act authorized three different funding streams: adults, dislocated workers, and youth. Eighty-five percent of available adult and youth funds are disseminated at the local level, with the remainder reserved for statewide activities. For dislocated workers, 20 percent of the funds are reserved for federal activities, 60 percent for local activities, 15 percent for statewide activities, and 25 percent is reserved for state rapid response efforts. Each local workforce investment board has developed standards for success that are applied to organizations that are provided with funding assistance, and has a system in place to assess grantee eligibility.

In order to obtain funding from a local workforce investment board for a workforce development program, the interested utility(s) should consider creating a partnership group that would include local training centers, non-profits and academia. This group should define the specific mission of the partnership, supported with a statement of need and background data. A strategy should then be developed that identifies the programs necessary to accomplish the

mission as well as the anticipated timeline for implementation. Within the strategy should be an identification of the ways in which the partnership can interface with the local workforce investment board. The strategy should include a component that addresses adult/displaced workers and community youths, as these are the focus areas of grant funding by the workforce investment board. Examples of programs that could be funded by the local boards are provided in the following discussion.

Adult and Dislocated Worker Services

Funds allocated to local areas under the adult and dislocated worker funding streams are used at the local level to provide core services through the local one-stop centers, as well as to provide intensive and training services for program participants. Types of core services that could be developed by the utility consortium include:

- Job search and placement assistance, including career counseling
- Labor market information identifying job vacancies, skills necessary for occupations in demand, and relevant employment trends in the local, regional and national economies
- Initial assessment of skills and needs
- Providing information on available services and programs
- Follow-up services to assist in job retention

The funds available to workforce development consortia under this program can also be used to provide intensive services to unemployed workers who are unable to obtain employment through the core services. The Workforce Investment Board will also provide grants for programs that assist employed workers who may need additional assistance to obtain or retain employment. These programs could include services such as comprehensive assessments, development of individual employment plans, group and individual counseling, case management and short-term prevocational services.

The development of training programs is another activity that could be supported using the Adult and Disabled Worker funds. Eligible training programs include those that provide occupational skills training, on-the-job training, entrepreneurial training, skill upgrading, job readiness training, and adult education and literacy activities in conjunction with other training.

Youth

The youth program is the other area in which the workforce development consortia could obtain funding. For a workforce program to be eligible for youth grants, the program needs to assist low-income youths, ages 14 through 21, facing one of the following challenges to successful workforce entry:

- School dropout
- Deficient in basic literacy skills
- Homeless, runaway, or foster child
- Pregnant or a parent

- An offender
- Needs help completing an educational program or securing and holding a job

The partnership can receive grant funding for programs that prepare youths for postsecondary educational opportunities or employment, and link academic and occupational learning. Programmatic requirements state that those groups providing this service have strong ties to employers, which could be easily demonstrated by the organizations involved in the partnerships. The programs must also provide the following services:

- Tutoring
- Study skills training and instruction leading to completion of secondary school (including dropout prevention)
- Alternative school service
- Mentoring by appropriate adults
- Paid and unpaid work experience (such as internships and job shadowing)
- Occupational skills training
- Leadership development
- Supportive services

Any workforce development programs created to focus on youths must provide for summer employment opportunities that are linked to academic and occupational learning. This requirement opens the door for water utilities to create internship programs with positions in either the water utility's headquarters, or in the field to provide for hands-on learning opportunities.

Private Funding Model

In recent years, several initiatives have been established at the national and state level to create workforce development programs using private funding. The foundations involved in this effort are typically those listed in [Table 4.1](#), as well as charitable and philanthropic organizations that operate on a local level. The concept behind these funding collaboratives is that by banding together to focus their efforts, the outcome will be a cohesive approach that can better address the specific problem that is being targeted. Groups seeking to create a workforce development program should consider seeking funding from a private funding collaborative that is located in their community, but funded by a national collaborative. Or, as an alternative if this option is not available, the groups could consider disseminating information about their efforts to private companies and foundations located in the community and inviting them to form a funding collaborative to support the workforce development effort.

National Fund for Workforce Solutions

One of the private funding initiatives that currently exists at the national level is the National Fund for Workforce Solutions. This group is a national funding intermediary that was established to improve employment, training, and labor market outcomes for low-income individuals. The Fund provides support to projects that will improve both the quality of jobs and

the capacity of workers by promoting change at the individual, institution, and system levels. Investors have provided \$30 million to \$50 million in available funding to the group, which is used both to increase the number of local and regional workforce partnerships and to expand the scale of existing partnerships. The creation of a national funding intermediary allows for the alignment of grants from multiple foundations and other national workforce development funders into one central funding pool that can be used to carry out the work of the initiative. Some of the primary investors in the Fund include:

- Annie E. Casey Foundation
- Ford Foundation
- The Harry and Jeanette Weinberg Foundation
- Hitachi Foundation
- U.S. Department of Labor

At this point in time, the Fund has provided financial support to ten different regional collaboratives for the purposes of creating and/or sustaining local workforce development programs. These regional collaboratives include:

- Baltimore Workforce Collaborative: An alliance of approximately 70 organizations collaborating to improve the economic health of the city through the development of a workforce system that prepares city residents for skilled positions with employers who are experiencing critical workforce shortages.
- Bay Area Workforce Funding Collaborative: A public/private partnership of more than a dozen foundations and the California Employment Development Department designed to strengthen the workforce development infrastructure supporting the San Francisco Bay Area economy by promoting advancement opportunities for, and the economic stability of, low-skill workers, while fostering economic (see further discussion below).
- Greater Washington Workforce Development Collaborative: A broad-based collaborative that focuses on enabling children, youth, and families from low-income households to participate in and benefit from the region's prosperity through the primary planks of education and workforce development.
- Los Angeles Workforce Funder Collaborative: Provides direct support for workforce partnerships in three key industry sectors (healthcare, goods movement, and construction), business-to-business outreach and education and public policy advocacy to facilitate career advancement for lower-skilled adults
- New York City Workforce Innovation Fund: A consortium of foundations and corporate philanthropies that have pooled their philanthropic resources to address a range of workforce development issues (see further discussion below).
- Opportunity Chicago Collaborative: A cross-sector group that works to develop workforce partnership in five industries/occupational clusters that offer employment opportunities at a range of skill levels and are in sectors that match public-housing residents' self-reported employment interests.
- Pennsylvania Industry Partnerships Project: A partnership that proactively addresses critical workforce shortages in key occupations within the state's target

- industry sectors, and encourages business to upgrade existing their practices, including integrating technology more fully into business operations.
- **San Diego Workforce Funders Collaborative:** Coalition funding programs that focus on math- and science-related careers in the four targeted industry sectors (health care, biotechnology/life sciences, high technology, and construction, engineering, and technical occupations), targeting individuals who are unemployed and underemployed and linking them to education and training programs designed to support the region’s growing base of high-wage, high-demand jobs.
 - **Skill Up Rhode Island:** A community impact initiative led by the United Way of Rhode Island that invests in the development and enhancement of workforce partnerships to meet the needs of low-skilled, adult Rhode Islanders and the employers who hire them.
 - **SkillWorks: Partners for a Productive Workforce:** Collaborative effort of public and philanthropic funders concerned with the capacity of the greater Boston workforce development system to meet the needs of job seekers, incumbent workers, and employers.

These regional funding collaboratives support local workforce partnerships, such as those that could be organized by the water utility industry. The purpose of the partnership would be to organize key stakeholders and local resources within the industry sector to help workers gain the skills they need and to give employers access to the skilled labor they need. The National Fund for Workforce Solutions strongly advocates workforce partnerships and states that the key functions of these partnerships include:

- Pursuing a “dual customer approach,” serving businesses looking for qualified workers and job seekers and workers looking to advance their careers
- Organizing multiple institutions and funding streams around common goals
- Providing or brokering services—training and supports—that help workers gain access to the initial rungs of the ladder to economic opportunity and advancement
- Serving a variety of workers but recognizing and addressing the special needs of lower-skilled, lower-wage workers and job seekers
- Reducing turnover and increasing economic mobility of workers
- Testing and adapting innovative approaches to workforce problems
- Catalyzing improvements in public systems and business employment practices

The regional collaboratives typically support the workforce partnerships by providing direct grants to the partnership and by assisting with policy advocacy, professional development and capacity building strategies. A more detailed discussion of two of the regional funding collaboratives, and their workforce partnerships, is provided below.

Bay Area Workforce Funding Collaborative (BAWFC)

As stated previously, this collaborative consists of private foundations and agencies within the California government coming together to create innovative workforce development

partnerships and maximize the effectiveness of their resources. In order to strengthen the region's workforce training infrastructure over the next five to seven years, the collaborative has identified six strategies to help the workforce development system meet the needs of employers and to improve economic security for low-income people in the Bay Area. These strategies are (as identified on the BAWFC website):

- Understand the unmet skill needs of Bay Area employers who have long term labor shortages by researching current labor market information on economic sectors and occupations with sufficient growth, ease of entry, mobility, and wages
- Provide adequate support services to job seekers, including career counseling, job placement, retention, and other services that are aligned with the sector strategy
- Increase the skills of low-income residents, immigrants, dislocated workers, and others by providing specialized skills training and job placement services
- Provide streamlined and improved services through greater coordination among employers, workforce investment boards, educators, training providers, community colleges, labor, service providers, job developers and other regional stakeholders
- Provide learning opportunities for stakeholders to inform program designs, service interventions, and ongoing course corrections
- Align and increase private and public resource systems to support the above five strategies

Grants provided by the Foundation, in combination with state resources, employer commitments, and educational dollars, provide a strong financial background for the development of workforce programs. The San Francisco Foundation, which chairs the BAWFC, manages the philanthropic mutual fund while the California Employment Development Department manages the grants provided as part of the public-sector Workforce Investment Act.

New York City Workforce Innovation Fund

As previously stated, the New York City Workforce Development Funders Group is a consortium of foundations and corporate philanthropies that joined together to pool their philanthropic resources to address a range of workforce development issues facing the New York City area. In 2005, this group partnered with the New York City Department of Small Business Services to create the Workforce Innovation Fund (WIF). The purpose of the WIF is to fund projects that provide for a new model of workforce development that links workforce development services to economic development strategies and investments. As stated on the WIF website, "by helping workforce development policymakers, employers, and practitioners gain an understanding of business hiring practices and internal pipelines, the initiative aims to create more employment and advancement opportunities for New York City residents while meeting the needs of employers." The WIF is supported by federal Workforce Investment Act funding for customized training, as well as by funding from the participating private foundations.

The first venture of the Workforce Innovation Fund was the New York City Sectors Initiative (NYCSI). The Initiative will provide support to sector-based employment efforts and will work to increase the capacity of sector intermediaries. The underlying belief associated with

the Initiative is that the intermediaries can create partnerships with employers by developing an understanding of a given sector or industry and meeting the needs of the industry's employers. Example outcomes include providing worker training, improving worker productivity, and meeting key personnel needs. Two projects have received funding to launch pilot programs as part of NYCSI, in the fields of health care and biotechnology:

- Metropolitan Council on Jewish Poverty: Provided a grant of \$1.5 million over three years to launch the Medical Pathways program. This program provides customized training, support and employment services to over 125 participants, who will be placed in high-demand target occupations including state-certified emergency medical technicians, state-certified paramedics and radiology technicians.
- SUNY Downstate Tech Center: Provided a grant of \$860,000 over three years to implement the Biotechnology Scholars Program. The goal of this program is to create a workforce for the growing biotechnology sector in New York City and to place 127 participants in biotechnology positions. The grant will support the expansion of an existing biotechnology workshop and internship program at Hunter College. It will also allow for more recruitment of students into the program from CUNY's two-year and four-year colleges, curricula development and internship design, as well as job placement assistance.

CHAPTER 5

SECTOR COLLABORATIVE FRAMEWORK

The options for collaborative initiatives amongst water and wastewater utilities are many in number, structure and participants. Figure 5.1 attempts to represent the dimensions of levels and breadth of collaboration and the involvement of organizations that are possible in designing collaborative workforce initiatives. Initiatives can be designed at the national, regional and local levels with the participation of utilities, industry associations, educational institutions and other industries.

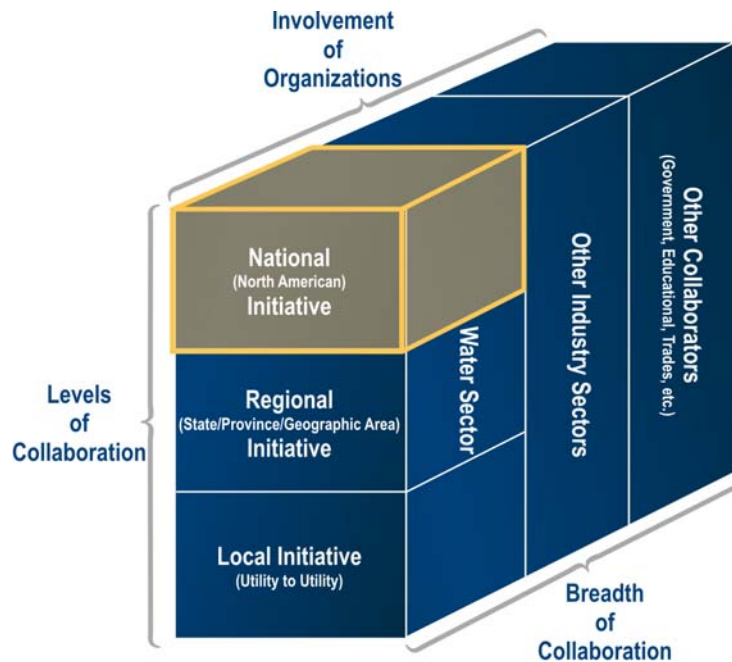


Figure 5.1. Framework for workforce collaborative initiatives (“national strategy” shown highlighted)

One purpose of this report, as well as the November workshop, is to provide interested parties with background information on collaborations that are viewed as successful such as those highlighted in Chapter 3, introduce the funding organizations that contributed to their success and provide a common knowledge base to move forward in defining collaborative initiatives in the water and wastewater sector. Questions that the reader may consider for utilities to improve their workforce sustainability through collaboration include:

1. What level(s) of collaboration are needed to be successful?
2. What breadth of collaboration is needed to be successful?
3. What involvement of organizations is needed to be successful?
 - Utility organizations
 - Water sector associations
 - Funding organizations
 - Federal, state, local governments

- Other organizations and associations (non-water sector)
4. What lessons from other sector collaborations apply to the water and wastewater sector?
 5. In what ways can organizations work together to achieve the common goal of utility sector workforce sustainability?

The remainder of this chapter briefly presents some of the benefits of collaboration and the functions of workforce partnerships as defined by the National Fund for Workforce Solutions.

What are the Benefits of Collaboration?

An article by Geri Scott of Jobs for the Future discusses the reasons that funding sources collaborate on workforce issues. Many of the reasons she cites in her article are equally applicable for the organizations that comprise the water sector to come together in collaboration to address workforce issues. Some of those reasons include:

- To unleash the power that comes from jointly committing resources to address a large and immediate problem
- To catch the attention of other organizations in the sector to show the benefits of collaborating
- To join together around a strategic vision to better attract funders, workforce boards and government decision makers to support the collaboration
- To impact public policy that impacts the water utility sector at the federal, state and local levels
- To match the right collaborative solution to the right set of circumstances in a national, regional or local setting
- To share learning, training and benchmarking across the collaborative

Guidelines for Workforce Partnerships

The National Fund for Workforce Solutions (NFWS) was presented in Chapter 4 as a potential funding source for water sector collaborative initiatives. The NFWS particular focus is workforce partnerships that address the skill shortages, unfilled jobs, low productivity, and increasing disparities that exist between people with and without education and skills. The key functions of the partnerships are to:

- Organize resources from multiple institutions and funding streams to support and sustain workforce advancement
- Pursue a dual customer approach, serving businesses looking for qualified workers and job seekers and incumbent workers looking to advance their careers
- Provide or broker services – education, training, asset development and support services – that help workers gain access to the initiative rungs of the ladder to economic opportunity and advancement
- Serve a variety of workers, but recognizing and addressing the special needs of lower-skilled, lower-wage workers and job seekers

- Reduce turnover and increasing economic mobility of workers
- Test and adapt innovative approaches to workforce problems
- Catalyze improvements in public systems and business employment practices

Successful workforce partnerships engage businesses in the structure of the partnership as a formal part of decision-making and ongoing governance. They also specify benefits and outcomes for individuals, employers, and the systems that affect employers and low-skilled adults. Partnerships have a long-term orientation on the impact and outcomes for their partners, individuals, and systems.

Collaboration Framework in Action

A two-day workshop was held in Arlington Virginia on November 6 and 7, 2008 to test the collaboration framework and determine possible collaboration opportunities within the water utility industry. Participants included the Steering Team for this project, utility presenters and participants, association representatives, government organizations, and energy sector organizations. Over 60 participants contributed reports on current workforce activities, ideas for collaboration, and discussion about priorities to continue the initiative.

Ideas for Collaboration by Topic Area

The first discussion by workshop participants focused on identifying ways that utilities or the industry might collaborate within ten topic areas that address the span of workforce planning and development.

1. Retention
2. Recruiting and Selection
3. Internships and Coops
4. Apprenticeships
5. Employee Development
6. Working with Educators
7. Working with Workforce Investment Boards (WIBs)
8. Partnering with Unions
9. Operators Certification
10. Technology to Support Workforce Initiatives

Highlights of the discussion are presented in Appendix B. Ideas were captured in a roundtable brainstorming session and will require vetting and discussion by leaders in the industry to determine the most important areas to move forward.

Ideas for Collaboration Based on Geography

The second discussion by workshop participants focused on identifying possibilities for collaboration based on geographic definitions. Note that there is a need for utility leaders and the industry as a whole to further vet these ideas with the goal of prioritizing and moving forward.

- *National* - inclusion of utilities from across the US and Canada

- *Regional* – a cluster of utilities in a geographic region that can feasibly work together
- *Local* – one utility collaborating with another in a local area

Opportunities for collaboration were identified for each geographic sector. Local collaboration possibilities were identified around six topics including training, recruiting, sharing services, raising awareness, assessing needs, and WIBs. Regional possibilities included one regional voice, workforce needs, WIBs, federal dollars, other industry partnerships, career tools and education. Opportunities for national collaboration included going forward, brand and image, workforce development and education, workforce planning and metrics, outreach to potential workforce, collaboration leadership, and alternatives to increasing utility workforce. A summary of each discussion is presented in Appendix B.

CHAPTER 6 FINDINGS AND RECOMMENDATIONS

Several themes emerged during the workshop discussions on opportunities for collaboration and are supported by the research conducted for this project. In this report section, the themes are presented then mapped to three primary “project” recommendations that could be completed by a consortium of utilities, industry associations and funding partners. Recommendations for future research are presented to complete this section.

THEMES FROM WORKSHOP DISCUSSIONS

Each theme is presented with thoughts on implementing the theme at the local, regional and national level. [Figure 6.1](#) is a framework (repeated from Section 5 of this report) for defining collaborations around these themes of workforce issues.

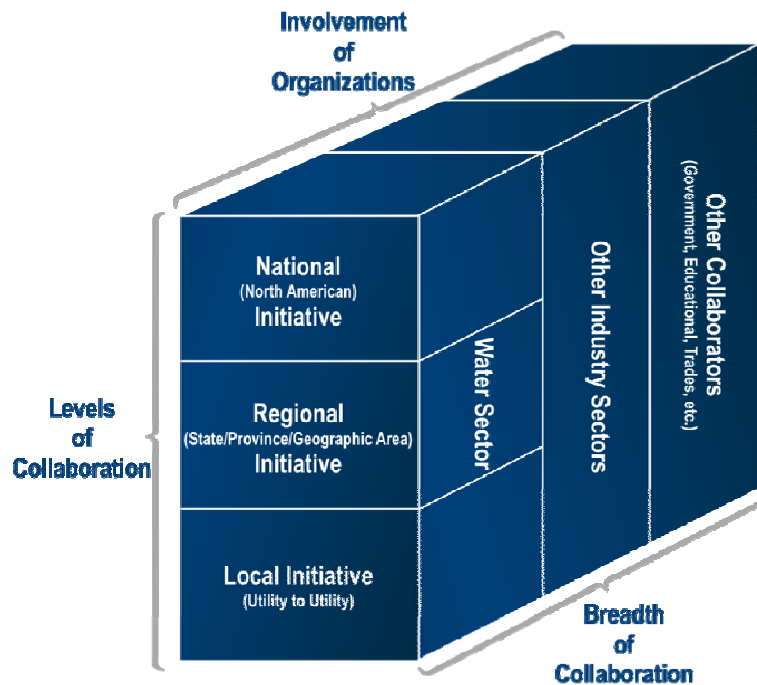


Figure 6.1. Framework for collaboration on themes

Employee Development

There are many opportunities for utilities to share programs, costs and resources associated with employee development. Shared programs might address these areas:

- Several types of training: specific skill sets including operator training, high-tech operator, SCADA technicians, leadership, communication, teamwork, management (including mid-level manager), and on-the-job training. Many programs already exist, such as AWWA’s high tech operator certification

program and the Water Treatment Operations Certification Program. Existing training programs should be leveraged to fill critical training needs.

- Mentoring and coaching programs
- Orientation programs
- Internships, cooperatives and apprenticeships
- Work sharing and/or job swapping
- Certification courses and exam preparation

At the local level these programs might take the form of a series of training events that are provided to multiple utilities that have developed a cost sharing model. In small communities this could go so far as to share the cost of operators, machinists, or other trades positions.

Regionally, utilities could coordinate with one another and with educators to design and deliver community college training programs.

At the national level, the industry might consider a clearinghouse for standard training materials; a database of internship, cooperative and apprenticeship programs; provide templates for orientation, mentoring and coaching program.

Use of New Tools and Technologies

New technologies are being successfully used by some utilities and other industries for recruiting, branding or completing the work of the utilities. Technologies that could be used collaboratively include:

- Podcasts
- YouTube
- My Space
- Videoconferencing
- Wikis
- Splash pages
- Blogs
- Facebook
- Web-based training
- Mobile Computing
- Share Point
- SCADA

Locally and regionally, many of these technologies could be used to recruit and advertise the utility(ies): podcasts, blogs, Facebook, My Space, and splash pages are all good tools for that purpose. YouTube could be used to create training videos that support a shared training program that is delivered in a web-based format. Wikis and Share Point might be used for a collaborative knowledge management program. SCADA was mentioned as a technology option that could support monitoring of multiple utility facilities.

Nationally, many of these tools could be used to support imaging and branding of the water sector industry as well as for nationally developed and delivered training programs.

Industry Image and Branding

There is a strong current of energy expressing the thought that the water sector associations must work together to rebrand the industry (AWWA, Water Research Foundation, WEF, WERF, AMWA, NACWA, and others). This includes educating the public as to what a water industry career entails and the opportunities that are available. The “green” environmental stewardship side and the high-tech aspects of the industry should be communicated.

At a local level utilities can share marketing materials or a local marketing campaign to build the industry image.

At a regional level utilities might create a body that represents the industry and speaks as one voice communicating a common message.

Nationally, the associations must communicate water as a growth sector and create a national campaign segmented with specific messages to targeted groups.

Certification Reciprocity

Employee mobility is a critical issue for the water sector by two very different types of mobility:

- Employees are sometimes restricted from moving to new communities or states due to lack of certification reciprocity.
- Employees do not see a path for advancing in the utility due to lack of career paths that are clearly defined and perhaps supported by certification requirements.

Action is required at the regional or national level to develop a model or template for certification reciprocity. This might take the form of a regional competency certification (assuming multiple states in a region). Additionally a common career path and common definition of positions and responsibilities would aid mobility.

Workforce Shortages

It is critical that the industry quantify the shortage in a meaningful way – identifying the pipeline of workers and skill sets that is required to meet operating standards and regulations over a given time period. This data provides the basis for the water sector being classified into a critical cluster eligible for federal funding.

Locally, utilities can identify their worker and skill set needs in order to communicate those to a regional or national body seeking critical cluster status. Additionally, utilities might work together to create a single labor pool for entry level positions that could be tapped by multiple utilities.

At the national level, the industry could establish a clearinghouse for workforce planning and development with one responsibility being to gather the pipeline data. This body could also serve as a clearinghouse for job opportunities, resources, best practices, recruitment material and branding material.

Connecting to Schools

This theme is focused on the primary through high school relationship. The overall sense from the workshops is that utilities should connect with schools beginning early – at the primary level. At the primary and middle levels, this might focus on educational programs; at the high school level it might take form of technician programs for learning future job skills and partnering for career days.

At a local level, utilities might share materials for career days and share resources for teaching educational programs.

Working With Educators

There may be huge benefits for utilities to partner with educators in developing standard industry curriculum and jointly applying for federal grant money to fund training program development. Partnering with educators could also be a path for sharing educational programs across industries such as utilities sharing educational programs with the trades. A national or regional utility coalition could also speak to the community college association as one voice defining training needs and requirements that are implemented uniformly on a national level.

The most bang for the buck on this theme appears to be aligning educational needs and implementing programs at the national level.

Working With Workforce Investment Boards (WIBs)

There seems to be a general consensus that the water sector needs to be educated on Workforce Investment Boards – what they are, how to work with them, the types of programs funded, etc. This is a great opportunity for partnership to fund workforce development activities. Many of the shared programs defined in this report section under Employee Development could be funded by a WIB source.

The education about WIBs should take place nationally, driven by the industry association leadership or similar body. Implementation of activities with WIBs may occur at the local, regional or state level since many WIBs seem to disburse funds at those levels.

Working With Unions

It is critical to partner with unions on workforce activities. The general sense is to connect early with unions at a local, regional and national level to communicate the sense of urgency around the workforce and skill shortage faced by the industry to mutually understand the benefits of utilities and unions working together to address the pipeline issues. Unions could also be a source of funding for certain training programs.

A huge benefit could be realized by defining a utility/union partnership at the national level that is carried down to the regional and local levels.

Civil Service Organizations and Compensation Differences

There is a very strong sense that the rules governing hiring and retention frequently impact a utility's ability to review the right skilled candidates for an opening, hire quickly, and offer incentives that will retain employees. Coupled with this is the compensation difference that often exists between utilities and competing local industries that may keep a utility from hiring the most qualified candidates in the local labor pool.

Two actions were identified in the workshop discussions: that "work arounds" to the Civil Service process will continue to be needed as utilities address workforce issues; and that the industry must work together to reform Civil Service policies.

THREE PRIMARY PROJECT RECOMMENDATIONS

The themes presented above map to three primary “project” recommendations that could be completed by a consortium of utilities, industry associations and funding partners. Those three recommendations focus on:

- Creating a Water Sector Job Image
- Defining Water Sector Career Pathways
- Implementing a Water Workforce Resource Clearinghouse

Each recommendation is presented with an explanation of the recommendation, issues to consider in executing the project, and key elements of the solution.

Create a Water Sector Job Image

The recommendation focuses on re-brand existing jobs in the water sector to appeal to current and future labor pools by tapping into specific drivers that reflect the interest of the targeted pools (e.g. concern for human health and the environment, “green jobs”, job stability, job mobility or flexibility, high-tech, etc.) The focus would be to develop an image to attract workers to water/wastewater utilities as the “employer of choice”.

Issue

Mission-critical positions need to be filled (e.g., treatment and distribution/collection operators, engineers, and utility managers) and a “pool” of future talent identified, developed, and created. These positions are in short supply due to retirements of baby boomers, competition from other industries, and lack of “appeal” for the water market. Without these mission-critical positions, the reliable operation of our nation’s water infrastructure to supply safe drinking water and collect and treat wastewater is at-risk – both now and in the future. The water sector to-date has not taken a proactive approach to rebrand or reposition these jobs to create a positive public perception in the labor market.

Key Elements of Solution

- Outreach to potential talent pools via multiple channels with new/appealing messages
- Leverage current water sector campaigns (e.g., “Tap Water Delivers”, “Water is Life”) to integrate opportunities for building positive public perception
- Align and coordinate activities of multiple water sector associations and individual utilities to best apply common messages, media, and methods via national (North American) initiative
- Build a water sector-wide outreach website to focus key messages and coordinate/align activities among potential workers, associations and utility employers
- Provide branding materials that can be adopted by local utilities and regional coalitions for their outreach purposes

- Create awareness and develop coordinated outreach activities with federal, state and local workforce-related government entities. Attain “high growth” status for water sector workforce needs
- Create partnerships with organizations for improved access to current and future labor pools (retirees, veterans, ethnic groups, STEM students, etc.)
- Align core competencies, career pathways, standardized job descriptions, and other industry information to make it easier for the water industry to compete for the talent pool.

Define Water Sector Career Pathways

This recommendation focuses on transforming existing fragmented, limited job positions into career pathways with common growth and flexible or mobile job opportunities; and creating opportunities for reciprocity in certified job classifications by common skill-based competencies and common educational curriculum requirements.

Issue

Existing job positions and classifications are unique to individual utilities. This limits common educational, developmental and quality assurance process/practices. Current employees lack clear career paths and opportunities within specific utilities and within the water sector (nationally and internationally).

Key Elements of Solution:

- Define key operational job positions for water and wastewater utilities with common competencies (knowledge, skills, abilities), and align them with the US Department of Education “career clusters and pathways”.
- Quantify predicted labor needs based on utility retirement eligibility data
- Redesign positions around skill requirements and match increased skill levels with increased compensation
- Identify existing training programs within utilities and colleges that meet a standard set of training requirements.
- Define a single set of training materials for discrete positions within the industry.
- Design program content for positions such as water treatment operator that can be adopted by community colleges.
- Develop integrated internship, apprenticeship and mentoring programs with national templates for industry application.
- Work with unions to jointly develop training programs and apprenticeship opportunities
- Create a coalition of utilities to design training for internship and apprenticeship programs that serve all participants.
- Deliver a shared training program with standardized credentials. For internships or co-op programs, ensure a designated number of trainees will be employed by participating utilities

- Develop a reciprocity plan for operator certification at the national level, for state-by-state adoption and use
- Develop job sharing or rotation for training and mentoring across multiple utilities through a training partnership program
- As a coalition, apply to community Workforce Investment Boards and other funding sources (e.g. federal grants) for funding and support of shared education and training programs

Implement a Water Workforce Resource Clearinghouse

This recommendation focuses on establishment of a clearinghouse that promotes sharing of workforce related information and documents among utilities and partnering organizations. Utilities need examples of other’s programs and the related information and documents that many utilities are willing to share. Clearinghouse members would have access to this information and continually contribute updated and latest resources.

Issue

Avoid having individual utilities “re-invent the wheel”. Utilities need to leverage “good examples” or “best practices” by adopting and adapting what others have already done and proven successful. Examples of current and relevant workforce materials from utilities and partnering organizations need to be accessible to other utilities.

Key Elements of Solution

- Define the clearinghouse concept in terms of membership, information to be shared and ways to manage the provision of and access to the information.
- Create a workforce website that includes a section on “best practices” that can be a storehouse for utilities to share effective practices in use at their organizations, or as seen in other industry sectors.
- Use technology to create interactive sharing and use of resources such as:
 - standardize job descriptions, classifications, and pay grades
 - recruitment information (e.g. innovative job announcements)
 - materials for high school classrooms
 - materials for summer camps
 - example internship or coop programs
 - example mentoring programs
 - example outreach materials for schools, both students and educators (e.g. job fairs, career days)
 - web conferences or seminars to provide awareness of the Water Workforce Resource Clearinghouse
 - links to websites of related workforce information and examples from other industry sectors

RECOMMENDATIONS FOR FUTURE RESEARCH

Much research remains to be conducted to support identifying solutions to the workforce situation faced by water utilities. Many of the research recommendations presented below support components of the three primary project recommendations presented in this section.

Research recommendations include:

- Obtain annual and updated utility workforce demographic data in order to clearly define the severity of the workforce situation in the water industry. Quantifying labor needs is critical to the utility industry being classified as part of a career cluster by the Department of Labor and included in their high-impact, high-growth, high-demand programs.
- Identify the impacts of the current economic downturn on the water utility workforce situation. Examine issues such as how the downturn influences the quantity of workers needed to fill openings, the longevity of workers eligible (or soon to be) for retirement, the interaction of generations in the workforce, and others.
- Research and design career clusters for the water sector that are in alignment with Department of Labor career clusters and pathways.
- Identify a process to turn solving the workforce labor situation over to the generations that will be required to live with the solutions. Stop having the baby boomer generation create these solutions. Engage Gen X and Y as leaders in this process and have them lead identification of solutions to workforce issues.
- Examine the impact of the use of social media by private industry and other public sector agencies for purposes such as branding, recruiting and training. Identify the uses of social media that have provided positive results for other industries and public sector agencies and define methodologies to apply those to the water utility sector.
- Research the requirements for operator certification by state or region identifying differences and similarities. Conduct a process to integrate these into a unified national certification that supports mobility of workers.
- Partner with the American Association of Community Colleges to identify successful educational partnerships with the water industry and enhance partnerships with those educational institutions and develop written documentation to support any state or region that wants to duplicate those efforts, such as a Banner Center or Center of Excellence
- Partner with the American Association of Community Colleges to research and evaluate existing curricula for water and wastewater treatment operators. Define a process to integrate the curricula into a single sector curricula and a process to build that curricula into community colleges throughout the United States.
- Research the ways other industries are tapping into the Gen X and Y labor pool. Identify the successful messages and connections that are attracting workers to those industries. Design a comparable program/template for use in the water sector.

APPENDIX A

WORKFORCE DEVELOPMENT SURVEY

Workforce Development Survey	
1. Utility Information	
<p>In this part of the survey, we will be collecting information on your utility.</p>	
<p>Please enter the name of your utility.</p> <input style="width: 100%;" type="text"/>	
<p>Your name is:</p> <input style="width: 100%;" type="text"/>	<p>Please provide a phone number where you can be reached.</p> <input style="width: 100%;" type="text"/>
<p>Your job title is:</p> <input style="width: 100%;" type="text"/>	<p>Please provide an email address where you can be reached.</p> <input style="width: 100%;" type="text"/>
<p>Your AwwaRF Project Team contact is:</p> <input style="width: 100%;" type="text"/>	
<p>What is your corporate structure?</p> <p><input type="radio"/> Public: Part of local governance - City, County, non-enterprise fund</p> <p><input type="radio"/> Public: Part of local governance - City, County, enterprise fund</p> <p><input type="radio"/> Public: Independent governance</p> <p><input type="radio"/> Investor-Owned (private or public traded stock)</p> <p><input type="radio"/> Other</p> <p>If "other," please specify</p> <input style="width: 100%;" type="text"/>	

What is your utility's form of governance?

- Board of Directors or Commissions
- City or County Government
- Other

If "other," please specify

Please check all of the services provided by your utility.

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <input type="checkbox"/> Potable Water Treatment <input type="checkbox"/> Potable Water Distribution <input type="checkbox"/> Raw Water Transmission (wholesale) <input type="checkbox"/> Wastewater Collection <input type="checkbox"/> Wastewater Treatment <input type="checkbox"/> Stormwater Collection <input type="checkbox"/> Stormwater Treatment | <ul style="list-style-type: none"> <input type="checkbox"/> Reclaimed Water Treatment <input type="checkbox"/> Reclaimed/Irrigation Water Distribution <input type="checkbox"/> Electric Generation <input type="checkbox"/> Electric Distribution <input type="checkbox"/> Natural Gas Distribution <input type="checkbox"/> Solid Waste Collection <input type="checkbox"/> Solid Waste Transfer/Disposal |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Other (please specify)

System Size by Population Served (Retail + Wholesale Service Area Populations):

- Less than 10,000
- 10,001 - 50,000
- 50,001 - 100,000
- 100,001 - 1,000,000
- More than 1,000,000

Number of employees in utility:

- Less than 100
- 101 - 250
- 251 - 500
- 500 - 1,000
- Over 1,000

Is your labor force unionized?

- Yes
- Partially
- No

Is your organization required to comply with Civil Service?

- Yes
- No

2. Workforce Development Needs Assessment

Identification of Mission-Critical Classifications

Please identify up to 20 mission-critical classifications where you have experienced or anticipate problems with quantity (ability to recruit staff with adequate qualifications) and/or staff work preparedness.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Identification of Mission-Critical Classifications

Please identify the Census code that is associated with each of the mission-critical classifications.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.

Categorization of Mission-Critical Classifications

Please categorize the functions of the previously identified mission-critical classifications where you have experienced or anticipate problems with quantity (ability to recruit staff with adequate qualifications) and/or staff work preparedness. Select the category that best applies to each mission-critical classification

	Water/ Wastewater Treatment Operations	Engineer	Electrician; Maintenance Tech; Instrument Tech	Mechanic; Machinist; Other Maintenance Tech	Collection/ Distribution/ Transmission Sys. One	Environ.	Reservoir/ Hydropower Operations	Other
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If "other" was selected for one of the classifications; please explain.

Using the mission-critical classifications that you identified in Question 1 of this Section, use the following table to identify the operational function(s) that may be at risk if the position(s) are vacant.

	Hydropower	Water Supply (Quantity)	Water Delivery Reliability	Water Quality	Environmental Stewardship	Customer Service	Safety, Security, and Emergency Response	Wastewater Collection	Wastewater Treatment
#1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
#20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Using the mission-critical classifications that you identified in Question 1 of this Section, use the following table to identify any workforce development challenges that have been observed with the position(s).

	Classification (Scope, Requirements, Pay, Career Ladder)	Recruitment/ Selection	Staff Training	Knowledge Retention
Classification #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Classification #20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Retirement Vulnerability Analysis: Using the mission-critical classifications that you identified as being at risk in quantity and/or work preparedness (from Question 1 of this Section), please complete the following table.

	Average Age of Incumbents	% of Incumbents Over Age 55	% of Incumbents Eligible for Retirement Within 5 Years	Your Assessment of likely degree of difficulty of replacing retirees in this classification
Classification #1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #8	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #9	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #10	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #11	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #12	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #13	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #14	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #15	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #16	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #17	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #18	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #19	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Classification #20	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Please provide your estimate of the level of risk associated with the factors below, in terms of your utility's ability to ensure that employees in mission-critical positions have the skill and information needed to perform their work reliably.

	High	Medium	Low
Retirement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Turnover	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changing Regulatory Requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New Facilities, Processes, Procedures, Technologies, and Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate Documentation on Facilities, Processes, Procedures, Technologies, and Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide your assessment of the following risks to your utility's ability to recruit qualified applicants for mission-critical positions.

	High	Medium	Low
Lack of an adequate labor pool with appropriate qualifications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of appropriate Civil Service Classification for skills needed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uncompetitive pay and/or fringe benefits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recruitment/selection process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Workforce Development Best Management Practices: Needs Assessment/Planning

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

What processes has your utility used to analyze its workforce development needs?

Has your organization adopted a Workforce Development Plan? If so, what are the goals and objectives of the plan?

What resources (time, staff, funding) were needed to perform the analysis and planning?

4. Workforce Development Best Management Practices: Expansion of Labor Pool

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

Please describe your utility's programs to expand the labor pool for mission-critical classifications.

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

5. Workforce Development Best Management Practices: Recruitment/Selection

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

Please describe your utility's programs to upgrade its recruitment/selection process.

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

6. Workforce Development Best Management Practices: Competency Analysis

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

Please describe your utility's programs to analyze the knowledge and skills needed by staff.

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

7. Workforce Development Best Management Practices: Staff Training

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

Please describe your utility's programs to upgrade the training provided to mission-critical staff.

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

8. Workforce Development Best Management Practices: Knowledge Management

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

Please describe your utility's programs to (e.g., mentoring, job shadowing, or cross-training) to retain knowledge and transfer knowledge between staff.

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

9. Workforce Development Best Management Practices: Documentation

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

Please describe your utility's programs to upgrade its documentation of facilities, technologies, processes, and procedures.

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

10. Workforce Development Best Management Practices: Technology

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

How has your agency used technology to support staff training or knowledge retention?

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

11. Workforce Development Best Management Practices: Organizational/Job Redesign

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

How has your agency modified jobs or its work practices to address changes in the workforce?

What has proven most beneficial?

What has proven most challenging?

What resources (time, staff, funding) were needed for implementation?

12. Opportunities for Collaboration

You may enter any information here that you would like the surveyor to know before they contact you. During your phone interview, the surveyor will discuss your answers to these questions to elicit more detail.

Do you have suggestions for collaborative efforts among utilities, with other industries, and/or at the regional and national level?

What external stakeholders (e.g., industry) will benefit most by the water industry's ability to address workforce problems (or be impacted most negatively if they are not)?

What external stakeholders (e.g., unions, educational institutions, labor boards) may be able to provide assistance?

APPENDIX B NOVEMBER 2008 WORKSHOP

Following is the agenda for the two-day collaboration workshop that was held in Arlington Virginia on November 6 and 7, 2008. Participants included the Steering Team for this project, utility presenters and participants, association representatives, government organizations, and energy sector organizations. Over 60 participants contributed reports on current workforce activities, ideas for collaboration, and discussion about priorities to continue the initiative.

Day 1: Thursday November 6th

7:30 am	<i>Registration and Refreshments</i>
8:00 am	<i>Welcome, Introductions, and Presentation of Session Objectives</i> Roy Martinez, Water Research Foundation, Craig Woolard, AWWA President-Elect, and Scott Kelly, JEA
8:15 am	<i>Presentation of Secondary Research on Utility and Other Sector Collaborative Initiatives</i> <i>Introduce Format of Panel Presentations and Discussion</i> Marcia Isbell, EMA
9:30 am	<i>BREAK</i>
10:00 am	<i>Panel Presentations: Management Practices in Use by Utility Survey Respondents</i> Carole Dascani, American Water Julie Hunt, Arlington, TX Curtis Mitchell, Colorado Springs Utilities Michael Wallis, East Bay Municipal Utility District Liesel Adams, Lehigh Valley Water Authority Cheryl Davis, San Francisco Public Utility District Donna Weis, Union Sanitary District Glenda Dunn, Waco, TX Carol Higley, JEA Discussion Facilitator: Denise O’Berry, EMA
12:00 pm	<i>LUNCH (provided by AWWA and Water Research Foundation)</i>
1:00 pm	<i>Water Sector Association Presentations on Current Initiatives and Collaborative Efforts</i> American Water Works Association, Craig Woolard, AWWA President Elect Water Environment Federation, Eileen O’Neill, Chief Technical Officer National Association of Clean Water Agencies, Paula Dannenfeldt, Deputy Executive Director Association of Metropolitan Water Agencies, Carolyn Peterson, Director of Communications and Public Affairs West Coast Water Utility Workforce Development, Cheryl Davis, Manager, Workforce Development Initiative, San Francisco PUC
3:00 pm	<i>BREAK</i>
3:45 pm	<i>Government Organization Presentations</i>

	EPA, Ronald Bergman, Chief, Protection Branch OGWDW Dept. of Labor, Charles Cox, Business Relations Group Dept. of Education, Larry Case, College and Careers Transition Branch Veterans Affairs, Herbert Thomas, Employment Coordinator Gerhard Salinger, Advanced Technology Education Program
5:00 pm	<i>Adjourn</i>
6:30 pm	<i>Participant's Dinner</i> (Optional – not provided by AWWA/Water Research Foundation)

Day 2: Friday November 7th

7:30 am	<i>Registration and Refreshments</i>
8:00 am	<i>Energy and Other Sector Collaborative Projects</i> Jim Rzepkowski, Director, Workforce Development, Constellation Energy Ann Randazzo, Executive Director, Center for Energy Workforce Development Andra Cornelius, Business & Workforce Development Opportunities, Workforce Florida and Florida Energy Workforce Consortium
10:00 am	<i>BREAK</i>
10:30 am	<i>Discussion on Utility Sector Collaborative Initiatives by Topic Area, Facilitated by EMA</i> Topics Areas Include: <ul style="list-style-type: none"> ▪ Retention ▪ Recruiting and Selection ▪ Internships and Coops ▪ Apprenticeships ▪ Employee Development ▪ Working with Educators ▪ Working with Workforce Development Boards ▪ Partnering with Unions ▪ Operators Certifications ▪ Technology to Support Workforce Initiatives
11:30 pm	<i>WORKING LUNCH (provided by AWWA and Water Research Foundation)</i>
12:30 pm	<i>Discussion on Utility Sector Collaborative Initiatives by Geographic Sector, Facilitated by EMA</i> National - meaning inclusion of utilities from across the US and Canada Regional – meaning a cluster of utilities in a geographic region that can feasibly work together Local – meaning one utility collaborating with another in a local area
1:45 pm	<i>Prioritization of Collaborative Initiatives, Facilitated by EMA</i>
2:00 pm	<i>Presentation of Top 3 ideas From Each Group</i>
2:20 pm	<i>Concluding Remarks</i>
2:30 pm	<i>Adjourn</i>

Workshop presentations are included on this report CD and are also downloadable at the Water Research Foundation website.

Ideas for Collaboration by Topic Areas

The first discussion by workshop participants focused on identifying ways that utilities or the industry might collaborate within ten topic areas that address the span of workforce planning and development. Highlights of the discussion are presented here. Duplicate responses were deleted, similar responses were rolled together. These ideas were a result of a brainstorming session and they need to be further vetted and discussed by leaders in the industry to determine the most important areas to move forward.

Topic: Retention

- Share Best Practices – become the “Employer of 1st Choice”
- Provide opportunities for mobility within sector [reciprocity]
- Leadership/supervisor training, other varied training experiences, include distance learning, funding for training
- Compensation education
- Partnering/”twinning” with others (countries, systems)
- Provide opportunities for additional responsibility and leadership
- Increase Executive awareness by training, conferences and peer to peer discussions; educate on new workforce realities
- Use mentoring programs, custom coaching, one-on-one coaching
- Develop/provide/improved orientation programs
- Pool utilities benefits programs
- Shift public awareness of industry – green, sustainable, clean public health
- Provide job rotation/work sharing between utilities, (counties)
- Restructure Civil Service “rule of 3”, collective bargaining, frameworks – job structure and money
- Conduct additional research on next generation workers: styles and management practices
- Develop common career paths

Topic: Recruiting and Selection

- Collaborate with workforce boards –State Level
- Improve image – 4 Associations AWWA, WEF, NACWA and AMWA – branding, recruit, industry, package, similar, asset management, effective utility management and model
- Develop integrated internship, apprenticeship, mentor programs, national templates and industry application
- Educate public about water careers; show what the work is about and how people can make a difference.
- Copy Energy Model
- Recognize that “Green” represents great opportunity
- Promote Civil Service work-arounds (!)
- Assure that salaries are competitive. Educate decision makers (water skilled trade)
- Sell the whole package: benefits, flexible schedule, hours (40 hr week) , type of work, child care facility, work-out rooms and health insurance
- Use podcasts/blogs/YouTube videos re: Videos of workers with utility
- Coordinate hands on career day for middle-schools, show them IT/SCADA
- Connect with guidance counselors on trades area
- Evaluate the selection process and how it works. Use teams in employee selection.
- Recognize that Websites are a good tool – face book of utility

Topic: Internships and Coops

- Create formalized, structured programs
- How to market? Investigate possibility of exchanging interns with other agencies
- Work with associations in schools; partner with specific schools; define how to collaborate
- AWWA can sponsor interns; Utility can apply for interns and be paid through AWWA
- Hire JR & SR high schoolers as technicians 8 hours/week on project type internships
- Collaborate with utilities for 13 week programs
- Identify how to hire an intern full time after the internship
- Collaborate with cities to use coops
- Utilize all industry association networks
- Create programs to identify careers – rotate high school students
- Identify careers in water stem distributive ED for high school
- Post resumes when internship completed on an AWWA database for students

Topic: Apprenticeships

- Work with Union early; conduct national conversation with unions defining barriers and benefits; use Union training programs; perhaps rotate apprentices nationally
- Implement half/half paid/volunteer programs
- Copy existing successful programs (lessons learned)
- Approaching schools early to have involvement, build awareness at young age
- Explore state involvement e.g. FL or CA
- Address readiness issues – math skills
- Collaboration between utilities to draw people in: boot camp and associations (copy Fire Department approach)
- Outreach to specific pools e.g., under-funded youth
- Show the benefit and uses of programs, why to use, demonstrate helpfulness, identify barriers to pipeline development
- Identify formal levels in career paths to show advancement, elevate the value of journeyman.
- Identify skill sets that work best for programs, identify new ways to train trades
- Utilize electrician training at Community Colleges
- Grant reciprocity for operators: easier movement, support movement, commonality for certification and ABC template for national level, work with EPA
- Get community support and understanding to sustain program

Topic: Employee Development

- Provide 3 levels of manager training: Senior leadership, mid level and entry level – l(e.g.,EBMUD) perhaps make it regional
- Tap into group of retirees – organize to support training, use senior staff as trainers
- Collaborate on OJT development. practices, career paths
- Develop a National template for certification reciprocity training
- Look at successful private industries – CASE & R&D their programs
- Go beyond technical skill training to include communication and teamwork
- Collaborate on common crafts across industries (national utility contractor’s association has a training program)
- Leverage web-based training (centers)
- Implement job swapping across utilities, rotation/temp assignment and manger swaps at the regional level
- Develop Best Practices of how to engage unions in employee development
- Add **fun** to training and account for different learning styles
- Develop/utilize regional competency certification programs
- Work on union relationships around development and funding for development
- Offer existing training to **others** (e.g., smaller utilities) and publish calendar

Topic: Working With Educators

- Apply for DOL grant (to workforce center or community college)
- Coordinate AWWA training modules with AWWA Sections and use in community colleges; create a career section on website;
- Investigate accreditations through State Boards
- Collaborate with EPA, DOL, DOE, national association of community colleges, ACTE, etc.
- Include water sector into green jobs and clusters
- Collaborate for on-line curriculums or training with NACC, government, utilities to provide on-line educational opportunities
- Use videoconferencing for teaching
- Create linkages for education and marketing, etc. between community colleges and universities (articulation agreements)
- Create linkages to allow high school apprenticeship programs apply to community college credits (articulation agreement). Start at the State to make it happen
- Identify other industries in utility region that requires/demands similar skill sets for the purpose of informing community colleges (i.e. electricians can be trained for water utility specificity)
- Develop and share DVDs between utilities on water careers – provide to schools
- Speak as a united voice to community colleges (AWWA, Water Research Foundation, WEF, WERF jointly shepherd high priority ideas)
- Conduct needs assessment for core foundational skills and training
- Investigate opportunities for non-traditional educators (community based organizations) to do work for water sector
- Utilities participate on industry advisory boards or committees to universities
- HR (collectively from several utilities) identify water utility skill sets and provides to universities
- Ensure that community colleges and high schools have the water education curriculum (not individual instructors)

Topic: Working With Workforce Investment Boards (WIBS)

- Educate utility industry about WIBs: How to find the website for DOL workforce boards? How to join and be an active member of the WIB? How to connect at the local and state board? Rural community involvement in WIB?
- Form a regional task force to promote small system involvement
- Complete labor forecasting (number of jobs in next 5 years/pipeline); HR managers provide head count data
- Advocate for water sector as a target DOL sector/cluster (like energy)
- Define and communicate “Green jobs” in the water utility sector
- Communicate infrastructure issues
- Work proactively to connect to DOL/EPA/community colleges for training and employment
- Create a value proposition; provide a consistent message about water sector, using 3-4 key messages about # of jobs; collaborate in region
- Provide the state with information on water systems data (i.e., using GIS map)
- Submit applications for DOL grants
- Expand the “State of the industry report” to include workforce issues
- Regionalize training and review by industry sector wide (40 utilities)
- Investment by all water sector for benefit of all water sector

Topic: Partnering with Unions

<ul style="list-style-type: none"> • Communicate sense of urgency, mutually beneficial goals, value proposition in partnering, explain workforce scenarios • Gain union leadership support • Use unions for recruitment and retention • Define job class structure, career path; Identify job commonality throughout the sector: common skills, tiered groups • Identify promotional opportunities • Training – Schools • Ensure knowledge retention through documentation and training 	<ul style="list-style-type: none"> • Develop national training programs • Use retirees in negotiation • Working conditions and wages have a Union focus • Test employees prior to hiring and evaluate the gaps in testing results • Include unions in state frameworks • Solicit the perceptions of a Panel of Labor Union leaders
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Topic: Operators Certification

<ul style="list-style-type: none"> • Investigate the current state of non uniformity and reciprocity • Support/implement education centers – schools of excellence and web based training • American Board of Certification • Elevate profession of operators – Provide educational materials to the Conference of Mayors to solicit increased funding • Encourage state colleges to collaborate with state agencies to address reciprocity, state with regional approach, legislation change, federal license, DOL or WIBs, associations, EPA (?) 	<ul style="list-style-type: none"> • Investigate National certification – “credential”...beyond state certification • Standardize basic curriculum for operators • Support large utilities training small utilities: i.e., Teach for America, circuit rider, deliver training to small utility and cluster training (e.g., Texas, California) • Build awareness of training opportunities • Investigate opportunity for water and wastewater to work together
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Topic: Technology to Support Workforce Initiatives

<ul style="list-style-type: none"> • Investigate appropriate use of on/boarding/recruitment/training human resource management systems • Implement E/learning tools, computer based training • Implement Go to meeting: teleconference/on-line web conferencing • Use Webinars for training • YouTube/MySpace for recruitment and marketing • Web Z.O. platform, shareware, interactive, open post materials, joy join, near time, calendar – Communication tool and collaborative efforts • Sure click – pop-ups on the internet/paid advertising that leads viewers to information or water/wastewater industry • Avatars to appeal to middle school 	<ul style="list-style-type: none"> • Investigate training options: simulation, e-learning, video-taping and video conferencing • Use water utility website to illustrate different jobs, develop and post short videos on each mission-critical category • Access to AWWA tools e.g. DVD’s on careers in the water industry <ul style="list-style-type: none"> ▪ P guidance on use of technologies ▪ Implement mobile computing for field workers to give them access to information ▪ Promote sector as a high-tech industry • Use knowledge management confluence software (e.g. wiki system, MTtoolbox) <ul style="list-style-type: none"> ▪ Use and maintain content on an internal Microsoft SharePoint website to search for standard operating procedures (SOPs) ▪ Investigate centralized SCADA monitoring for multiple utilities
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Ideas for Collaboration Based on Geography

The second discussion by workshop participants focused on identifying possibilities for collaboration based on geographic definitions. Note that there is a need for utility leaders and the industry as a whole to further vet these ideas with the goal of prioritizing and moving forward.

- *National* - inclusion of utilities from across the US and Canada
- *Regional* – a cluster of utilities in a geographic region that can feasibly work together
- *Local* – one utility collaborating with another in a local area

A summary of each discussion is presented here.

Opportunities for Local Collaboration

Possibilities for local collaboration were identified around six topics including training, recruiting, sharing services, raising awareness, assessing needs, and WIBs. Listed below are the possibilities that were identified by the workshop participants:

- **Training:** A program of events open to utilities. Training in safety, certification and exam preparation, leadership. Job specific training and job shadowing. Shared training based on a cost sharing model. Shared videos and webinars. Sharing training staff or delivery also by community colleges and unions.
- **Recruiting:** Sharing booths at job fairs, universities. Sharing themes/brands/materials. Sharing job descriptions. Linked web pages for job application materials. Create a pool of candidates for entry level positions. Work together to reform Civil Service.
- **Share Services:** Jointly funded workforce development position and/or grant writer. In small communities share operators, machinists.
- **Raise Awareness:** Share marketing using national materials. Local news/TV, articles. Use retirees for school programs. Girl/Boy scout partnerships. Website for curriculum for teachers.
- **Needs Assessment:** Know local pipeline needs to feed to state and national organizations. Identify risks associated with workforce shortage. Have data ahead of time to respond to grant opportunities.
- **WIB:** Join together to work with WIB once case has been made for water sector as a critical cluster. Consider including transient, non-community and transient systems. Shared grant writer.

Opportunities for Regional Collaboration

Possibilities for regional collaboration were identified around topic areas that included one regional voice, workforce needs, WIBs, federal dollars, other industry partnerships, career tools, education, etc. Listed below are the possibilities that were identified by the workshop participants:

- Establish a regional body to speak as one industry.
- Create a plan to address workforce needs at the regional level.

- Connect to WIBs
- Identify workforce champions who can coordinate in their area.
- Communicate regional needs to national group
- Secure and support effort to receive federal money
- Partner with other industries with similar skills sets
- Inventory career awareness tools available and create a repository (like a roadmap) of tools available to the region
- Coordinate around education
- Develop one message for the region
- Map sources of potential talent
- Implement plan at regional level

Opportunities for National Collaboration

Opportunities for national collaboration were identified around seven areas including going forward, brand and image, workforce development and education, workforce planning and metrics, outreach to potential workforce, collaboration leadership, alternatives to increasing utility workforce. Listed below are the opportunities that were identified by the workshop participants:

- **Going Forward:** Create a new message to potential workers, establish a clearinghouse for workforce planning and development, create job alignment and reciprocity and build a mechanism to move forward including funding.
- **Brand and Image:** Design a promotional campaign with message on worker image that show the industry is high-tech, offers a variety of work, is green/sustainable, supports public health, individuals can make a difference, maintaining a global resource, offers flexibility and stability. Communicate sector as a growth industry. Create a clearinghouse to share job opportunities, resources, best practices, recruitment information. Reach out to groups by segment using themes (e.g., water works).
- **Workforce Development and Education:** Understand the need in the industry, define titles to be used for common jobs, realign curriculum, develop career pathways, address reciprocity issue, develop training with educational institutions.
- **Workforce Planning and Metrics:** Gather industry data to support workforce needs.
- **Outreach to Potential Workforce:** Use of YouTube and Facebook for sponsored links, leveraging existing campaigns, speakers bureau and job fairs, and research on potential worker perspectives. Define workforce as “critical infrastructure” and define water as a “high growth” sector.
- **Collaboration Leadership:** Identify funding sources. Potential players included utilities, associations, and government organizations. Create a mechanism to carry this forward.
- **Alternative to Increasing Utility Workforce:** Use of technology and practices. Outsourcing. Consolidation.

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ABBREVIATIONS

AWWA	American Water Works Association
BAWFC	Bay Area Workforce Funding Collaborative
CERRA CEWD	The Center for Education Recruitment, Retention, and Advancement Center for Energy Workforce Development
DOE DOL	Department of Education Department of Labor
FUTURE	Fostering Utility Talent Utilizing Relationships in Education
GHP	Greater Houston Partnership's
IBEW	The International Brotherhood of Electrical Workers
MSP	Math and Science Partnership
NCCER NCTAF NYCIP	National Center for Construction Education and Research National Commission on Teaching and America's Future New York State Youth Construction Initiative Program
OBC	Oregon Building Congress
PETE	Partnership for Environmental Technical Education
RWDC	Real World Design Challenge
SIP STEM	Strengthening Institutions Program Science, Technology, Engineering, and Math
TBL	Technology-Based Learning
WANTO WCOMC WDTS WERF WIBs	Women in Apprenticeship and Nontraditional Occupations West Central Ohio Manufacturing Consortium Workforce Development for Teachers and Scientists Water Environment Research Foundation Workforce Investment Boards



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