



Commonwealth of Pennsylvania  
Department of Environmental Protection  
Bureau of Safe Drinking Water

**Five-Year External Review Report  
Operator Certification Program  
Calendar Years 2011 – 2015**

**November 5, 2015**

For submission on December 10, 2015 to the  
State Board for Certification of Water and Wastewater Systems  
Operators and the U.S. Environmental Protection Agency

## **Introduction**

The purpose of the Drinking Water and Wastewater Systems Operator Certification Program is to protect public health, safety, and the environment and promote the long-term sustainability of the commonwealth's drinking water and wastewater treatment systems. The 1996 amendments to the Federal Safe Drinking Water Act require each state to develop and implement a drinking water Operator Certification Program through rules and funding pursuant to §1419 of the Act. The U.S. Environmental Protection Agency (EPA) provides guidance for periodically conducting reviews of a certification program through both internal and external groups. EPA recommends that part of the review process consist of internal program reviews every three years and external reviews every five years. States are not required to report on all program elements but instead are encouraged to focus on any significant changes to the program.

External program reviews are performed by an entity outside the state primacy agency for the purpose of providing the state with a report describing the results of the review and listing recommendations for improving their program. In 2015, the Pennsylvania Department of Environmental Protection (DEP) initiated an external review. The Certification Program Advisory Committee (CPAC) served as the review team. Historically, at DEP's request, CPAC has been charged with providing comments and recommendations related to operator certification issues. The appointment procedures for CPAC members are established in Act 11 of 2002, the Water and Wastewater Systems Operators' Certification Act.

The contents of this report represent the external program review of Pennsylvania's Operator Certification Program for calendar years 2011 through 2015. Part 1 provides a summary of CPAC's comments on program strengths, areas of weakness, and recommendations for improvements. Part 2 includes the results of an electronic statewide survey that was distributed to drinking water and wastewater certified operators, system owners, training and exam providers, and examinees during July 1 through September 30, 2015. CPAC originally developed the survey in 2009; DEP added and refreshed questions in the 2015 survey.

## **Approach**

EPA provides two documents to assist States in conducting program reviews:

- *Final Guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems* (1999)
- EPA's Memorandum: *Conducting Internal and External Reviews on State Operator Certification Programs* (2009)

CPAC was convened on March 11, 2015 and received an overview of the 15 elements that may be included in an external review, including: staffing; budget; exam reviews; compliance rate determination; regulation review; enforcement; status of certified operators and trends; training and testing; renewals; database management; outreach; stakeholder involvement; state regulation changes; strategic planning; and primacy agency delegation and changes.

CPAC members were asked to rank the top three elements to focus the review. By majority vote, they selected the following elements (in priority order):

1. Status of Certified Operators and Trends
  - Tracking of operator certification and continuing education, statistics on examinees, distribution of operators across the state, etc.
2. Compliance Rate Determination/Enforcement
  - Number and types of water and wastewater systems with uncertified operators and inappropriately certified operators.
  - DEP's enforcement strategy, which was identified as a weakness in the three-year internal program review covering calendar years 2011 through 2013.
3. Strategic Planning
  - The vision of DEP and the State Board for Certification of Water and Wastewater Systems Operators (Board) of where the program needs to go within the next five years.

On May 28, 2015, staff in DEP's Bureau of Safe Drinking Water provided updates and statistics to CPAC on the above priority elements (see Appendix A). The CPAC members also received an overview of the approach to surveying drinking water and wastewater certified operators, system owners, training and exam providers, and examinees. Part 2 of this report includes a brief analysis of the results of the electronic survey (using SurveyGizmo<sup>®</sup>) that occurred from July 1 through September 30, 2015. Appendix B contains the full survey results. All results remained strictly anonymous.

## **Part 1—CPAC Findings and Recommendations**

The CPAC members identified the following areas of strength:

- **Number of Certificates Issued.** In late 2009, furloughs of commonwealth employees resulted in a reduction of available exams for operators. This

resulted in a significant reduction in the issuance of new operator certificates, from 516 and 412 certificates in 2008 and 2009, respectively, to 225 certificates in 2010. Due to the addition of DEP complement that is solely directed at supporting the program—plus staff training and administrative enhancements in the years leading up to 2014—613 certificates were issued in 2014, which is well above the pre-furlough levels.

- **Number of Examinee Seats.** After reaching a low of 393 exam seats in 2010, the number of available seats and available operator exams has been restored to pre-furlough levels. In 2015, approximately 2,500 seats have been made available for examinees. For the first time since 2008, some of the exam sessions have not been filled during 2015, which indicates that the supply of exam seats may finally be exceeding the demand. In all likelihood, we have now eliminated the backlog of exam requests in Pennsylvania.
- **Training Course Availability/Diversity.** For drinking water and wastewater operators to receive credit for training toward pre-certification experience or continuing education, DEP must approve the training activity. DEP approval ensures that competent providers are offering training that is relevant and meaningful to operators. Since 2006, Pennsylvania has experienced about a 10% annual growth in the number of approved courses for operators. Training providers are delivering courses in diverse formats, including classroom, web-based, and conference sessions.
- **DEP Staff Resources.** In 2011, DEP initiated a major reorganization that improved the Operator Certification Program through staff training, administrative enhancements, and online computer-based exams. In late 2014, DEP created complement that is solely dedicated to the Operator Certification Program using new fees established under 25 Pa. Code Chapter 302 (Administration of the Water and Wastewater Systems Operators' Certification Program). DEP staffing levels are now sufficient to meet the statewide demand for operator certification services.
- **Compliance with Certified Operator Requirements.** Over the past four years, the number of drinking water and wastewater systems without a certified operator has dramatically decreased, to 4% and 2%, respectively. By contrast, in 2011, 14% of drinking water systems did not have a certified operator and 11% of wastewater systems did not have a certified operator.
- **Identification of Operators-in-responsible Charge.** In each of the past three years, DEP mailed an Available Operator Report (AOR)—a snapshot of the information DEP has on record for a system and their available operators—to

each drinking water and wastewater system owner. The annual AOR verification is one of DEP's mechanisms for determining system and operator compliance. Data from the completed AORs has been compiled and provided to DEP regional and central office staff for review and use for inspections and investigations, permit/waiver requests, outreach assistance, and other program areas.

The CPAC members identified the following areas of weakness:

- **Aging Operator Workforce.** Pennsylvania has experienced a steady rise in the average age of Pennsylvania's operator workforce over the past decade. Most drinking water and wastewater operators are in the 50-to-59 age bracket. The scarcity of younger operators and the potential retirement of a large pool of older operators in the coming years may jeopardize the statewide pool of qualified operators.
- **Rural Operator Availability.** The CPAC members expressed concerns over the difficulty in hiring operators at small rural facilities when older operators retire. Anecdotal evidence suggests that rural drinking water and wastewater systems have difficulties in hiring and retaining certified operators. Although about 50% of Pennsylvania's *certified operators* currently hold a Class A certificate (for systems permitted at flow rates of >5 million gallons per day), about 60% of the *facilities* in the state only require a Class D certificate (flow rates of  $\leq 100,000$  gallons per day). As a result, there is an abundance of operators with high qualifications. Operators with the higher qualifications may be more inclined to work at facilities in urban areas and larger communities.
- **Chapter 302 Compliance and Enforcement Strategy.** DEP continues to develop a compliance and enforcement strategy for Chapter 302 Administration of the Water and Wastewater Systems Operators' Certification Program. The lack of a final strategy remains a weakness of the Operator Certification Program.
- **Exam Question Feedback.** DEP occasionally provides statistics on general areas of exam weakness (e.g., math) to all of the state's training providers. However, operators who fail a certification exam receive no specific feedback on the incorrect answers in their exam results. For example, questions are grouped into categories involving process control, operation, maintenance, sample collection, laboratory analysis, safety, etc. Operators who fail an exam do not have an option to determine which of these categories led to the highest number of incorrect answers on their exams.

CPAC provided the following recommendations:

- **Recruit Younger Workers.** Build a statewide foundation for engaging younger workers in drinking water and wastewater careers. To fuel local interest at an early age, work with school officials to provide opportunities for elementary, high school, and vocational technical students to take tours of local treatment plants. Tours can begin with a pre-trip presentation or video and classroom activities to introduce the concept of drinking water or wastewater treatment. Plant personnel can take students on a guided tour of the facility, where the group receives an overview of treatment processes. Virtual tours, numerous example videos, and other resources are available on YouTube and the Web.
- **Internship and Co-operative Programs.** Develop and promote local internship and co-operative programs for college students in communities with drinking water and wastewater treatment systems. In lieu of grounds-keeping duties, ensure that students receive hands-on experience with process control and monitoring as well as high-tech areas such as SCADA systems. Credit this work experience toward future operating experience requirements for certification.
- **CareerLink.** Work with the Department of Labor and Industry to promote drinking water and wastewater careers through the commonwealth's CareerLink system. Water and wastewater systems can list job openings on line in the CareerLink JobGateway. Additionally, explore options for adding water and wastewater courses and community college certificate programs to the statewide list of approved services/courses in the trade training list.
- **Sustainable Workforce.** Promote ways to sustain the operator workforce throughout Pennsylvania. DEP and the state's drinking water and wastewater professional associations should reach out to the public to advertise available resources on the Web. The following Web sites provide videos, fact sheets, and numerous other resources for high school and college students and military veterans:
  - *Work for Water* (developed by the American Water Works Association and Water Environment Federation). Visit [www.workforwater.org](http://www.workforwater.org) .
  - *Water Sector Workforce* (U.S. Environmental Protection Agency). Visit [water.epa.gov/infrastructure/sustain/ws\\_workforce.cfm](http://water.epa.gov/infrastructure/sustain/ws_workforce.cfm) .
- **Chapter 302 Compliance Training.** In calendar year 2015, DEP intends to publish a draft Compliance and Enforcement Strategy for public comment in the *Pennsylvania Bulletin*. In tandem with publication of the final version, DEP should provide statewide Chapter 302 compliance training for drinking water and wastewater system owners and operators as well as DEP field staff. The training

should include elements that balance the perception among prospective certified operators who feel that added responsibilities (i.e., holding a certificate) could lead to penalties and other repercussions due to certain provisions in Chapter 302. Such training will help reduce concerns about the consequences of becoming certified.

- **College Certificate or Associate’s Degree Program.** Colleges and universities may offer a certificate program or associate’s degree program in water and/or wastewater. These programs involve a series of training courses that lead to a certificate or diploma in water and/or wastewater treatment. Operators who complete a DEP-approved certificate program or associate’s degree are eligible for reduced operating experience necessary to qualify for certification. Currently, several colleges in Pennsylvania have a DEP-approved wastewater certificate program in their curriculum, including Montgomery County Community College, Delaware County Community College, Harrisburg Area Community College, and the Community College of Beaver County. Thaddeus Stevens College of Technology will graduate its first class of Water and Environmental Technology associate’s degree students in 2016. A long-term strategy should include building and promoting similar partnerships with other colleges and universities in Pennsylvania.
- **Individualized Exam Feedback.** For operators who fail a certification exam, DEP should explore options to provide individual feedback to the operator concerning categories that led to the highest number of incorrect answers on their exams.

## **Part 2—Survey Results and Analysis**

An electronic statewide survey (using SurveyGizmo<sup>®</sup>) solicited anonymous input from drinking water and wastewater certified operators, system owners, training and exam providers, and examinees from July 1 through September 30, 2015. Notices about the survey were distributed through the following channels:

- *Drinking Water News*, DEP’s semi-annual newsletter that has a subscriber distribution list of nearly 4,000 email addresses.
- Approved Exam Providers, professional associations, and the Pennsylvania Water Utility Council, with encouragement to post the notice on their Web site and/or distribute the information to members or contact lists.
- Index card flyers for distribution at certification exam sessions, professional association conferences, and other training events. DEP also included the card when mailing certificates to operators during the survey period.

- An email to all DEP field staff in the drinking water and wastewater programs, with encouragement to forward the notice to system owners and operators in their geographic work areas.
- DEP's Operator Certification Information Center Web site.

The full survey results are included in Appendix B. Additionally, for questions that provided the option, Appendix B includes all of the respondents' unaltered comments. 494 individuals completed the survey, with 471 individuals completing all questions.

The respondents are categorized as follows:

- 376 certified operators (4.4% of Pennsylvania's certified operators)
- 50 circuit riders
- 80 system owners

For comparison of the certified operator percentage with standard approaches used in business marketing, the average response rate is 0.5% to 2% for business direct mail campaigns, 0.1% to 10% for email campaigns, and 0.05% to 0.1% for banner display ads on the Web (as measured through click-through rates). Note that individuals may overlap in some of the above categories; therefore, the numbers are not additive.

The following statistics summarize the data from respondents:

- The average survey time was 11 minutes.
- 52% were from a wastewater system, 41% were from a drinking water system, and 7% were not currently from a system.
- 87% were male and 13% were female.
- The age groups were as follows: 7% were 18-30 years old, 25% were 31 to 45 years old, 30% were 46 to 55 years old, 33% were 56 to 65 years old, and 5% were over 65 years old.
- The years of experience were as follows: 27% had less than 10 years, 25% had 10 to 20 years, 23% had 21 to 30 years, and 25% have more than 30 years of experience.
- The annual salary levels were as follows: 6% earn less than \$30,000, 21% earn \$30,000 to \$45,000, 29% earn \$45,001 to \$60,000, 30% earn \$60,001 to \$80,000, and 14% earn greater than \$80,000 annually.

In 2010, as part of the external review process, DEP surveyed operators, systems owners, and exam and training providers using paper surveys. It was difficult to compare the 2010 and 2015 results because the electronic surveys expanded from simple yes/no questions in 2010 to scaled responses that provided more granular feedback in 2015. The following key trends and statistics were gleaned from the latest survey:



- DEP services received a positive tilt. These services include the Operator Certification Information Center Web site, Earthwise Academy, certification program staff, and field inspectors.
- Exam services received a positive tilt. These services include the number of exams offered, travel distance to exam sites, and paper vs. online exams. Notably, 55% of the respondents preferred electronic exams over paper.
- Training services received a positive tilt. These services included materials for exam preparation, DEP training modules, the ability to find courses for continuing education, variety of course topics available, and delivery format.
- System owners indicated that they have a good understanding of regulatory and program requirements. Their responses also tilted toward having difficulty in finding properly certified operators (49% reported it to be difficult or very difficult). The majority of owners indicated that, in their opinion, operators refrain from becoming certified mostly because the operators did not want to incur additional risks.
- The majority of operators indicated that they have a good understanding of their responsibilities.
- Most operators feel there should be a limit on the number of facilities a circuit rider operates.
- About 50% of the circuit rider respondents indicated that they have provided work plans and management plans to system owners.

Additionally, DEP received 226 general comments in the “Any other thoughts” section and numerous suggestions in areas of the survey where the option was available. DEP will consider each comment and review the information for trends.

In conclusion, the survey revealed the following overall observations and follow-up action items:

- Respondents indicated a general satisfaction with DEP’s services.
- Ratings of DEP’s training modules have improved, but DEP will continue to modify them.
- Course topic suggestions were received from 220 respondents. The comments will be organized and shared with training providers.
- Classroom courses are still preferred, but Web-based training also ranked high.
- Owners reported difficulty in finding properly certified operators.
- A majority of owners and operators appear to be aware of their primary responsibilities.
- There is a need for DEP to continue training and informing circuit riders of their responsibilities, including management plans. DEP will provide additional guidance for circuit riders in Pennsylvania.

## **Next Steps**

This final *Five-Year External Review Report* will be presented to the State Board for Certification of Water and Wastewater Systems Operators at their December 10, 2015 meeting. DEP will then work with the Board to prioritize and address CPAC's recommendations and at least annually report back to the Board on progress made as the recommendations are implemented.

DEP will also widely disseminate the report and its appendices—including the survey and all of the respondents' unaltered comments—to professional water associations, approved exam and training providers, and the U.S. Environmental Protection Agency. The information will be published on DEP's Operator Certification Information Center Web site.