**Synopsis**

Operator certification programs have long experienced difficulties in creating reciprocal recognition of certification. The Professional Operator certification program presents opportunities for operator certification authorities to improve reciprocity application processing. Benefits include the confidence gained from utilizing a transparent certification process designed to conform to international standards for certification, cost savings and efficiency increases for operator certification programs, and generally, an increase in the value of certification, thereby improving the perception of operator certification programs and the operators they certify.

**Background**

More than 40 years ago, a national group of industry experts concluded that the diversity of operator certification programs within North America undermined the value of certification. In response, the Association of Boards of Certification (ABC) was created to work with stakeholders to advance the quality and integrity of certification programs.

Today, all states and provinces recognize the importance of certification for water environment professionals, but every state, province, and territorial program approaches certification differently. Some programs require all operators, regardless of position, to be certified. Others require certification only for operators who work in a certain sector. Still others require only supervising operators to be certified. Whether certification is a job requirement, a legal requirement, or both, is dependent on a number of factors in each jurisdiction. In addition, any individual employer may choose to set minimum job qualifications higher than state or provincial requirements.

This diversity is largely responsible for the lack of “reciprocity,” or recognition of an operator certification awarded by a different program. A certified operator is likely to have difficulty gaining recognition of his/her certification by another certification authority, if that recognition is even offered at all. This issue, which has plagued the water environment industry for more than half a century, is one of the key reasons ABC was created.

**Variations in Program Development**

State and provincial governments spend significant time and resources developing and administering mandatory operator certification programs. Generally, each program’s standards, policies, and regulations are the result of decades of hard work and consensus-building efforts with program stakeholders. These efforts typically incorporate only the perspectives and practices of certified operators found in the specific state or province where the certification agency has authority. As a result, each certification agency develops its own unique conceptions of certified operators and what an
individual must do to become certified. This focus on what is known about operations in a particular region leads certification authorities to develop an overly specific conception of what it means to be a certified operator. Each certification authority develops its program in relative isolation, which all but ensures that certification requirements do not align between programs.

In addition, many certification programs run by government agencies, by their nature, are subject to inappropriate inter-government influences. Certification authorities often must bend to political pressures, even if it means their programs may be negatively affected. They also have to contend with unique state/provincial laws that require them to administer their programs in certain ways. Most operator certification authorities have to deal with bureaucratic and political constraints that can challenge the validity of their programs.

Given the manner in which operator certification programs are developed, it is unsurprising that there is a lack of certification reciprocity. This problem extends beyond recognition of certification and has real economic impact on operators, businesses, municipalities, certification programs, and the public.

**Costly Process**

For certification authorities, processing reciprocity applications takes markedly more time than processing other basic applications. The applicant is typically pursuing certification at higher levels, which generally means more documentation to examine. In order to verify all required information, the authority that assesses the reciprocity request often needs to confirm details with the applicant and the original certifying authority. Though there are certainly some exceptions, for the most part, this time-consuming, inefficient exchange of information requires parties to complete, submit, and process multiple sets of forms. Evaluating reciprocity applications can be a burdensome and resource-consuming procedure.

The cost of this inefficiency affects other industry stakeholders as well. Operators, or their employers, often have to pay additional fees to have certifications considered for reciprocity. These costs consume funds that could have been otherwise spent on a utility’s operational budget. Ultimately, taxpayers and ratepayers, as the primary sources of revenue to support utilities and government programs, bear the cost of a broken reciprocity system.

From a more general standpoint, developing a valid, sound, fair, and legally defensible operator certification program is an expensive and time-consuming undertaking (see the chart to the right for some cost estimates based on ABC’s exam development costs). A certifying organization must conduct research

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**Cost of Developing Exams for a Legally Defensible Certification Program**

- Total Cost per Initial Exam: $50,500
- Total Cost per Additional Exam Level: $17,500
- Total Cost for Exam Program with 4 Levels: $103,000

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on a broad population of operators to ensure its examinations and requirements align with what is seen in the field. Proper governance and infrastructure must also be developed and implemented to ensure all applicants are treated equally; this can be expensive. Certification authorities must continually invest in their programs if they are to remain valid and legally defensible. Periodic studies must be undertaken to ensure existing certifications still align to their respective professions. Exams must be updated to ensure they test candidates on relevant and current concepts, practices, and technologies. Administrative costs such as staff, IT, and other support infrastructure are inescapable. Operator certification authorities make do with limited resources; they do a commendable job, but they must also recognize the limitations of their programs.

Diminished Employment Opportunities
Operators seeking reciprocity typically are in one of three situations: they are looking for or have located employment in a new state or province; their current job requires them to travel and operate plants and systems in different locations; or they want to earn an additional certification to set themselves apart from their peers. In the first two scenarios, there is a water/wastewater system that is in need of an operator. Prospective job applicants looking to fill this need may refrain from applying due to the hurdles associated with getting their certification recognized by the local certification authority. Other operators might apply or even be offered the job, but experience difficulty in getting their certification recognized. It is not at all uncommon for operators to have to start the certification process over in order to meet their new certification authority’s requirements. By instituting restrictive policies, certification authorities effectively reduce the market of potential job applicants for water/wastewater systems in need by making it more difficult for operators from out-of-state, -province, or -country to attain certification even though they may be perfectly qualified. Recent research by the Water Environment Federation suggests that 30 to 40 percent of water environment utility employees will be retiring in the next 10 years, so it is of the utmost importance that certifiers remove unnecessary certification restrictions and allow qualified operators to replace an aging workforce (Task Force on Workforce Sustainability).

Public Recognition
Working professionals in other industries enjoy public recognition for the job that they perform, largely because the public values the services they provide and trust that people working in the profession met certain standards in order to practice. Water and wastewater operators do not benefit from having a single set of clear and consistent standards for certification, as these standards vary from location to location. As all certifiers are requiring different standards, many applications for reciprocity are denied. This demonstrates an absence of confidence in not only the certification being considered for reciprocity and the program that issued it, but the operator’s competency as well. If the water environment industry itself has difficulty knowing who it can trust, how can the public be expected to have confidence in the industry, much less recognize operators as professionals?

Needs
All operator certification programs have the same goal—to safeguard public health and the environment by ensuring only qualified individuals operate water and wastewater systems. With this in mind, it
should not be terribly surprising that certification authorities are hesitant to award certification via reciprocity without being absolutely sure of applicants’ qualifications. The problem is that this hesitancy has detrimental effects on the certifying agency, operators, and the public at large. At a time when certifying agencies regularly struggle to secure necessary resources, a tool is needed that provides greater assurance of a reciprocity applicant’s qualifications through an inexpensive, robust information management system. As the sole organization dedicated to advancing the quality and integrity of environmental certification programs, ABC and its Certification Commission for Environmental Professionals (C2EP) have answered the call to meet this need.

**Solution**

The Professional Operator certification and designation program, launched in 2014, is administered by C2EP, an autonomous organization of volunteer water environment operations subject matter experts (SME) created by ABC. The PO program is offered worldwide and highlights the considerable knowledge, skill, and ability of the operators who earn the PO certification. The PO program offers four types of certification: water treatment, water distribution, wastewater collection, and wastewater treatment. Each type has four levels (Class I through IV). Operators earning any of these certifications are granted the right to use the industry’s first ever professional designation for operators, thereby giving them the permission to refer to themselves as “Professional Operators.” Both C2EP and the PO program were designed to conform to rigorous standards for certification organizations, specifically the International Organization for Standardization (ISO) 17024 *Conformity assessment—General requirements for bodies operating certification of persons* and the National Commission for Certifying Agencies (NCCA) *Standards for the Accreditation of Certification Programs*. Pursuit of conformity with these standards means that the PO program strives to certify operators in a precise and impartial manner, making the PO program valuable for not only operators, but for operator certification authorities to use as a resource as well.

In addition to seeking conformity with certification standards, ABC commissioned an industry-wide study to gauge interest and examine the efficacy of a national certification program like the PO program. ABC enlisted Persuadable Research Corporation to develop a survey to reveal attitudes regarding operator certification program practices. Stakeholders included water environment operators, employers of operators, utility managers, and water environment regulators. This extensive quantitative and qualitative research surveyed more than 400 industry stakeholders on their opinions on the state of certification programs. Highlights of the results of this 2013 survey are shown in the graphic, on the next page. All received comments were taken into consideration to build the Professional Operator certification and designation program to respondents’ specifications.
Certification authorities can create considerable efficiencies and reduce program burdens by recognizing and granting reciprocity to operators who have earned the PO. For the first time, operator certification authorities now have a psychometrically sound certification program that conforms to international certification standards at their disposal. Instead of denying reciprocity applications, operator certification authorities can create an alternate pathway to reciprocity by allowing the applicant the chance to demonstrate competency through the PO program. Doing so would give the operator the only operator professional designation while giving the certification authority greater assurance in the operator’s competence and, potentially, access to information gathered during the PO certification process. More information about the science behind PO program components and how the program might serve certification authorities follows.

**Governance and Organization**

C2EP was created to administer ABC’s voluntary certification programs in accordance with ISO and NCCA standards for certification. Both the ISO and NCCA standards require autonomy and impartiality in decision-making in certification matters. Further, if a certifying organization wishes to conform to those standards, it must thoroughly document its organizational structure and system of governance. To these ends, ABC enacted a bylaw change to allow its Board of Directors to create autonomous commissions. Soon after, C2EP was created to administer ABC’s voluntary certification programs and develop its standardized examinations. A diagram of C2EP’s organizational hierarchy can be found on the next page.

### 2013 Qualitative and Quantitative Studies of Attitudes on OpCert Programs: Research Findings

More than **80 percent** of respondents felt “there is a need for an industry-developed, peer-reviewed certification.”

**Characteristics of an ideal operator certification program:**

- Focused on standardization
- Administered by a non-profit association
- Administered online

**Problems with the current state of operator certification:**

- Lack of reciprocity
- Unclear weighting of experience and education during eligibility reviews
- Inconsistent rulings on candidate eligibility

**Suggested improvements to the certification process:**

- Adoption of a national or international standardized certification program that conducts its processes with transparency and increases opportunities for certification reciprocity
- Widely recognized designation for operators accepted by a number of industry constituencies

More than **80 percent** of respondents felt “there is a need for an industry-developed, peer-reviewed certification.”
As an independent organization, C2EP has the sole authority to make certification decisions and is free from undue influence by outside stakeholders, ABC included.

The ISO and NCCA standards also emphasize the importance of ensuring certification organizations have broad stakeholder representation and that those involved in the certification process meet defined requirements. C2EP is comprised up of an executive commission and several committees. The executive commission is made up of nine commissioners—seven C2EP volunteers, the ABC President, and the ABC Chief Executive Officer. In keeping with the previously identified ISO and NCCA standards regarding organizational autonomy, the ABC President and CEO are unable to vote or make decisions, thereby limiting the amount of influence ABC can wield within C2EP. C2EP’s composition ensures that multiple perspectives are considered, many industry constituencies are represented, and most important, actual operators are involved in the decision-making process.

As previously mentioned, C2EP maintains four Scheme Committees, one for each certification type. Each committee is made up of operators and industry stakeholders with significant experience in the type of operations corresponding to the committee. “Scheme” is a term defined by the ISO 17024 standard as the “specific certification requirements related to specified categories of persons to which the same particular standards and rules, and the same procedures apply.” Each Scheme committee is responsible for continually evaluating its four “schemes” (Class I-IV) to ensure the certification scheme is reasonable and effective, as indicated by program data. Essentially, this means that C2EP tasks water treatment professionals with developing the requirements for PO certification in water treatment, wastewater collection professionals to do the same for the wastewater collection operator certification requirements, and so on and so forth. C2EP has created a number of other committees to perform
specific certification program functions, all of which are staffed by volunteers with experience relevant to the task assigned. C2EP regularly seeks out operations SMEs willing to volunteer their time and expertise for its projects.

Finally, both the ISO and NCCA standards warn of the loss of impartiality and conflicts of interest that can occur when certification organizations conduct training. C2EP does not conduct any training, so those making certification decisions are unlikely to become familiar with applicants on a personal level. This reduces the possibility that familiarity would threaten the impartiality of C2EP’s decisions.

By conforming to these standards for organization, C2EP ensures that qualified industry stakeholders make decisions free from inappropriate influence. Applicants can therefore be sure they will be treated fairly and evaluated according to standards set by knowledgeable subject matter experts throughout the certification process. Operator certification authorities can trust that those who have earned the PO have met all requirements and earned the credential solely on the basis of their qualifications and ability.

**Examination**

The keystone of the PO certification and designation program is the ABC/C2EP standardized examination. ABC enlists the assistance of professional psychometricians (examination development experts) to develop examinations in accordance with professional and technical guidelines such as those detailed in the *Standards for Educational and Psychological Testing* (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education), NCCA certification standards, and the ISO 17024 standard. This allows ABC to be confident its examinations used to identify candidates for certification are valid, psychometrically sound, reliable, fair, and legally defensible. New job analyses and exam specifications are required by policy to be redeveloped at least every five years; those in current use were redeveloped in 2010. In addition, during the 2010 initiative, examinations for all certification types (Class I–IV of the four core areas of operations) were revalidated. An overview of the examination development process can be found below.

**Examination Development Process**

Like most examination development efforts, this latest revalidation began by first assembling an inventory of the tasks operators perform and listing the various forms of knowledge, and the concepts and abilities required to perform those tasks. The items on each list were categorized by relevance to each class of operations (I–IV) and transposed into a survey. These surveys instruct respondents to consider each listed task, indicate how frequently that task is performed, and evaluate how important it is to complete that task correctly. Similarly, the survey also asks respondents to consider how often a particular ability or operational concept is used, along with how important those abilities and concepts are to performing the job effectively.
Included at the beginning of these surveys are a set of demographic questions that identify respondents’ qualifications. These questions indicate whether or not to include each respondent’s input in the final analysis of each certification class of each operations type. For instance, a Class III wastewater treatment operator’s responses would be incorporated into the survey findings relevant to Class III wastewater treatment operations, but not Class IV operations. This ensures the survey results for each operator type/class subgroup come from people who are actually doing that specific job. Substantial participation is needed to be confident the survey results accurately reflect the current state of each operational sector on a national or international scale. To ensure sufficiently large sample sizes, this survey is distributed to thousands of operators. The 2010 revalidation saw the participation of more than 3000 survey respondents from North America and abroad, meaning that the results and the exam developed from them reflected critical operational practices of a varied demographic.

After the surveys are closed and the results are analyzed, a set of examination specifications is crafted. These specifications serve as a blueprint to build the exam and collectively identify the most critical tasks operators are responsible for completing—ABC calls its exam specifications Need-to-Know Criteria for this reason. Once these documents are drafted they are used to select appropriate examination questions, or “items,” for inclusion in the certification exam form. If appropriate items cannot be found within ABC’s extensive item bank, then ABC calls on its SME committees to write new items. Finally, draft exam forms are created, and final studies are conducted to beta test the examinations and select an appropriate cut score. The 2010 revalidation was completed in 2012, and new examination forms were released shortly thereafter. C2EP began the next cycle of examination redevelopment in summer 2014.

All applicants for PO certification are required to pass a current ABC standardized examination in order to be considered for eligibility. Candidates deemed eligible are directed to Applied Measurement Professionals (AMP) to schedule their examination. AMP administers PO examinations by computer at its secure international network of examination centers. Use of computerized examinations enables PO candidates to select a testing center, date, and time of their preference. By partnering with a trusted organization like AMP to administer the exam, C2EP ensures that examinees have the same examination experience, regardless of which testing center they choose. With AMP administering PO certification examinations, C2EP distances itself from certification candidates and further reduces opportunities for impartiality to be compromised.

ABC and C2EP develop the industry’s most widely used certification examinations. These exams are valid because they measure what they intend to measure and are supported by a wealth of psychometric evidence. They are reliable because scores are consistent, regardless of the location or time of the examination. They are also fair because all examinees have an equal opportunity for success. Adherence to strict standards during examination development and requiring examinees to attempt the examination via a standardized method ensures that passing an ABC/C2EP examination is a true professional achievement. PO candidates who earn passing scores have objectively proven their ability
to apply their knowledge and skills to effectively operate water environment systems, and PO certification is an affirmation of that fact.

**Eligibility Criteria**

To conform to NCCA and ISO 17024 standards, C2EP is required to demonstrate that its certification eligibility criteria are not arbitrary and that the criteria fairly determine whether applicants have sufficiently demonstrated competency. In a new report, NCCA identifies SME consensus discussion and use of empirical data as the most common methods used to arrive at valid eligibility criteria (Brazell). The current PO eligibility criteria were developed by C2EP Scheme Committees who referenced ABC research on North American operator certification program requirements. These groups used this data to engage in consensus discussion to develop fair requirements that also happen to align with the majority of programs. The PO program is similar to the majority of programs in that it features four Classes or levels of certification and requires applicants to document general education. It also requires documentation of increasing amounts of experience, usually totaling about four years at the highest level of certification, and increasing amounts of post-secondary education, usually totaling about 1800 contact hours at the highest level of certification (*Compare*). A number of flexible substitutions were also developed between criteria so that applicants could substitute education and experience interchangeably for up to half of each requirement. These groups were also involved with the job analysis revalidation, and incorporated the findings of that project into their analysis. C2EP plans to regularly reevaluate the PO eligibility criteria to ensure they constitute fair expectations of applicants.

With strict documentation requirements and eligibility criteria that align to recognized industry practices, those who earn the PO will often meet eligibility requirements set by other certification authorities. An overview of these requirements can be found on the next page.
In addition to meeting the appropriate set of eligibility criteria and passing an examination, applicants for PO certification must agree to adhere to the Professional Operator Code of Conduct. Those who earn PO certification are expected to behave in accordance with this document or risk losing their certification. By following the Code, certificants become better operators and encourage their peers to do the same.

Not all operators pursue voluntary certification. By utilizing the PO program as a reciprocity aid, certification authorities can ensure that potential applicants recognize the value of their contributions to society and are committed to industry ethics.

Recertification
Certification is an ongoing arrangement. Recertification, sometimes known as “renewal,” is the process a certified individual must complete to demonstrate that he/she is still competent in the area in which he/she was certified. Both the NCCA and ISO standards emphasize the importance of a fair and engaging recertification process. To conform to these standards, C2EP must demonstrate its recertification requirements confirm and enhance the continued competence of PO certificants.

When working on recertification procedures, C2EP Scheme Committees used a process similar to the method used to document eligibility criteria. They referenced research of operator certification recertification practices to determine which practices were prevalent. The Scheme Committees
identified a continuing education-based recertification system that requires certificants to document a prescribed amount of education on relevant subjects as the best fit for the PO program. The committees decided certificants must go through the recertification process every two years, starting two years after their certification date. The Scheme Committees determined this time cycle provided sufficient assurance that certificants regularly pursue professional development and keep up to date with their industries, and by extension, demonstrate continued competence. The Committees developed a schedule of hourly requirements for each certification type that increases with the class of certification. The potential risk to the public is highest for operators performing larger-scale, more complex operations. Accordingly, the Scheme Committees determined that operators holding higher class PO certifications, which correspond to larger-scale, more complex operations, must demonstrate more professional development per cycle than those holding lower class PO certifications. Finally, Approved Topics Lists were created for each certification type to guide the approval of continuing education courses. A summary of the PO recertification requirements can be found below.

In addition to developing recertification requirements, conformance to the ISO 17024 standard requires C2EP to confirm certificants are compliant with the current certification requirements at the time of recertification. This means that C2EP must ensure all individuals holding a PO certification comply with the current requirements for certification, even if there are changes to the PO program. There is no “grandfathering” allowed. Should there be any significant change to the PO certification requirements, C2EP will inform certificants, develop a timeline for compliance, and check for compliance at recertification.

PO recertification requirements ensure that certificants are regularly evaluated for competency and continued personal development. As an added measure of confidence, all individuals going through the recertification process are required to once again agree to adhere to the Professional Operator Code of Conduct.

<table>
<thead>
<tr>
<th>Class</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>16 contact hours of continuing education on approved topics within two-year certification lifetime</td>
</tr>
<tr>
<td>Class II</td>
<td>16 contact hours of continuing education on approved topics within two-year certification lifetime</td>
</tr>
<tr>
<td>Class III</td>
<td>20 contact hours of continuing education on approved topics within two-year certification lifetime</td>
</tr>
<tr>
<td>Class IV</td>
<td>24 contact hours of continuing education on approved topics within two-year certification lifetime</td>
</tr>
</tbody>
</table>

**Web-based Application Process**

C2EP administers the PO program through a versatile web database. The database allows operators to build professional profiles that document general and continuing education, work experience, and certification history. An operator can submit an application based on this professional profile at any time. After the web-based application performs an initial screening for eligibility, program staff and C2EP
perform an in-depth review and confirm exam eligibility. Operators who pass the examination and earn the PO can continue to update their profile to have an online record of their entire career.

ABC and C2EP envision a battery of functionalities to build into this database to add value for operators and operator certifiers. One such functionality would expand ABC’s database of certification programs and connect it to PO profiles. Professional Operators would be able to view the eligibility criteria and application requirements of all known operator certification programs to better understand what they need to do to earn reciprocity. Another planned functionality would allow applicants and certificants to grant third parties access to their profile, potentially giving their employer or certification program administrators the ability to access and export information about the operator’s certification status. Finally, an electronic registry of POs will be created so that industry stakeholders and the public at large can easily verify an individual’s certification status.

C2EP and ABC will continue to evaluate input for future database developments to ensure it remains a valuable tool for applicants, certificants, and industry stakeholders.

**Professional Designation**

PO certificants have the right to identify themselves as “Professional Operators.” This professional designation does more than give these individuals a nice title. Like other professional designations, the PO designation provides the public a greater appreciation for what operators do and the knowledge, skills, and abilities required to perform the job safely and correctly. Further, it characterizes the operations field as a viable and rewarding career path. C2EP issues operators who earn certification and the PO designation a certificate, wallet card, and lapel pin to help them properly display their accomplishment and status as a PO (see below for examples of these documents). With many industry organizations and governmental agencies forecasting an impending shortage of operators, this will aid in attracting more young people to enter the field, thus ensuring a sustainable and professional operator population to meet society’s future needs.
Implementing this Solution
Certification authorities can save significant time and effort by accepting the PO program for reciprocity. Certification authorities can direct operators who want reciprocity to the PO program. C2EP can then perform its expedient, but thorough, eligibility review and relay eligible operators to AMP to schedule their examination. This process can be completed within two weeks. C2EP will work with the operator and the certification authority to distribute documentation collected during the certification process to the certification authority for review and/or recordkeeping. C2EP makes policies and processes as transparent as possible so the public and industry stakeholders know exactly what they are getting when hiring a Professional Operator. Certification authorities who trust in the science behind the C2EP certification process can award reciprocity to POs with absolute peace of mind at no cost to their programs. There is no better solution than that.

Summary
C2EP strives for conformity with international standards for certification, is comprised of leaders in the water environment operations industry, and is an affiliated organization of the association certification authorities have come to depend on for the last 42 years. The PO program reflects certification industry best practices and is based on an international job task analysis completed by more than 3000 certified operators and with guidance from exam development experts to ensure fairness, reliability, and validity. This certification and designation program presents an extraordinary opportunity for certification authorities to improve reciprocity in a way that conserves program resources and assures the competency of applicants by deferring to a trusted organization to do the work. Those who earn the PO are required to thoroughly document their qualifications in a robust web database that has many potential applications.

As many in the industry will attest, the water environment industry faces many challenges, but the C2EP PO certification and designation program is primed and ready to be part of the solution.

Call to Action
ABC urges members and other operator certification authorities to utilize the PO program to alleviate reciprocity struggles. In the interests of program efficiency and increased recognition for water environment operators, ABC and C2EP request all operator certification authorities to accept PO certificants for full reciprocity.
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