



Pollution Prevention: Graduating to Competency-Based Training

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Introduction

For the past twenty years, new pollution prevention (P2) facilitators have been trained using traditional methods. This training was designed to help them understand what they needed to know. P2 trainers relied on the many excellent databases available on the Internet that contain success stories and anecdotal information. For the most part, these new facilitators learned about material substitutions and P2 technology diffusion.

More recently, P2 trainers seek to include some level of skill development. The US Environmental Protection Agency publication, "An Organizational Guide to Pollution Prevention," presented information about process mapping, the Systems Approach, environmental management systems, and basic problem solving tools including root cause analysis. People have to realize that it takes time and experience to develop skills. The rush to get the P2 facilitators in the field often is at odds with skill-based training. Traditional P2 training is often ineffective when the goal is to train individuals to perform specific job-related skills.

There have been other problems with traditional P2 training. With its focus on success stories, new trainees do not learn that chemical substitutes that remove the threat of carcinogenicity may be flammable or cause severe allergies with the people who use them. New technologies create problems with the process since they are not properly introduced with a "systems" view. There is little realization that "everything is connected to everything else." Unwittingly, the P2 training is encouraging the focus to shift from environmental problems to health and safety problems which create process upsets elsewhere in the system. These problems point out the importance of grounding the training in the real world where P2 is applied.

One way to improve the quality of the training of P2 facilitators is to move to a technique known as "competency-based training" (CBT). This approach to training is a system that measures success through mastery of specific knowledge and the skills to use that knowledge. While traditional, time-based approaches are instructor-based, the CBT approach is conversely a participant-centered approach. Although each approach to P2 training has its proper place in a facilitator's

learning pathway, CBT appears to offer some significant advantages in the area of P2 training.

What is CBT?

Competency-based training is a participative method of training. It does not feature a lot of lectures. Focused exercises are used to develop knowledge and skills. There is continual feedback being provided by the CBT instructor to the candidate. There is no grading in competency-based training. Participants are examined as either "competent" or "not yet competent." There are no failing grades. Someone who is "not yet competent" will be provided with a "learning pathway" by the CBT instructor in order to provide more evidence or more assessment opportunity until the candidate achieves competency (ability to perform the task). The CBT instructor keeps working with the candidate until the required skill can be demonstrated. This is very much like apprenticeship programs of the past.

It is important that CBT be adequately prepared. An organization known as RABQSA¹ is a leading promoter of CBT and has a very informative web site with guidance for preparing these training programs. The steps in preparing a CBT training program include the following:

- P2 competencies are selected carefully
- Supporting P2 theory is integrated with skill practice
- Essential knowledge is learned to support the performance of skills
- Detailed training materials are keyed to the competencies to be achieved and are designed to support the acquisition of knowledge and skills
- Methods of instruction involve mastery learning - all participants can master the required knowledge or skill, provided sufficient time and appropriate training methods are used
- Participants' knowledge and skills are assessed as they enter the program and those with satisfactory knowledge and skills may bypass training or competencies already attained
- Flexible training approaches including large group methods, small group activities and individual study are used



- A variety of support materials including print, audiovisual and simulations keyed to the skills being mastered are available
- Satisfactory completion of training is based on achievement of all specified competencies.

Many countries operate their entire education system using CBT. However here in the United States, the traditional education model rules. RABQSA certifies CBT courses and instructors for quality and environmental management systems. The CBT techniques work quite well for P2 facilitator training as well.

Defining Competency

One of the documents included in the RABQSA CBT courses is entitled, "Guidelines for Quality and/or Environmental Management Systems Auditing²." It provides a reliable listing of the components that constitute competency (see Figure 1).

The P2 facilitator's knowledge will be defined by the individual competencies that the CBT training provider feels are important for successful work in this P2 discipline. It is important to note that unlike the case of the ISO quality and environmental management standards, no independent body has yet determined what the P2 facilitator skills should be. If one was to use the competencies for a RABQSA certified environmental management specialist as a guide, the P2

consultant would have to demonstrate competency in the following areas:

- Understand the application of P2 principles
- Understand the P2 needs of different operational processes
- Assess the risks with and without P2 actions
- Assess the effectiveness of P2 methodologies making sure there is no transfer of problems to other parts of the system of shifting an environmental problem for a health and safety problem
- Assess the P2 roles and responsibilities with the context of the organizational environment
- Assess the P2 projects in light of the overall business strategy
- Determine the adequacy and effectiveness of the overall P2 program.

A significant effort is required to determine the competencies for a P2 facilitator. For each of the seven competencies listed here, a CBT training provider would have to determine the performance criteria that will be used to judge each of the competencies. The training providers would also have to prepare a listing of evidence that they will accept that demonstrates that a P2 facilitator is indeed competent. Figure 2 shows a representative table with an idea of how the information would be presented.

Failure to properly identify these knowledge competency elements and making them very clear at the outset will likely result in ineffective training. CBT trainers help the participants move down a learning pathway by observing their progress with exercises designed to develop the skills necessary to use the knowledge that is provided. It is important that the trainers be educated in CBT so that they will not revert to the traditional way of teaching and not adhere to the CBT model.

The CBT process should make P2 facilitators aware of how personal *attributes* enable them to be more effective in their role as a P2 facilitator. The P2 facilitator should be:

- Open-minded – willing to consider alternative ideas or operator views
- Diplomatic – tactful in dealing with the employees
- Observant – actively aware of physical surroundings and activities
- Perceptive – instinctively aware of and able to understand situations
- Versatile – adjusts readily to different situations
- Tenacious – persistent, focused on achieving objectives
- Decisive – reaches timely conclusions based on logical reasoning and analysis
- Self-reliant – acts and functions independently while interacting effectively with others
- Able to see opportunities rather than threats.

Many of these attributes are commonly found as selection criteria for P2 facilitator positions. Even with very little experience in the P2 facilitation field, it is easy to see the importance of these attributes. They enable the P2 facilitator to work effectively with employees and the management representatives in the organization. Not everyone will have all these attributes. However, they must be aware that these attributes will help them be more successful when working on P2 assignments.

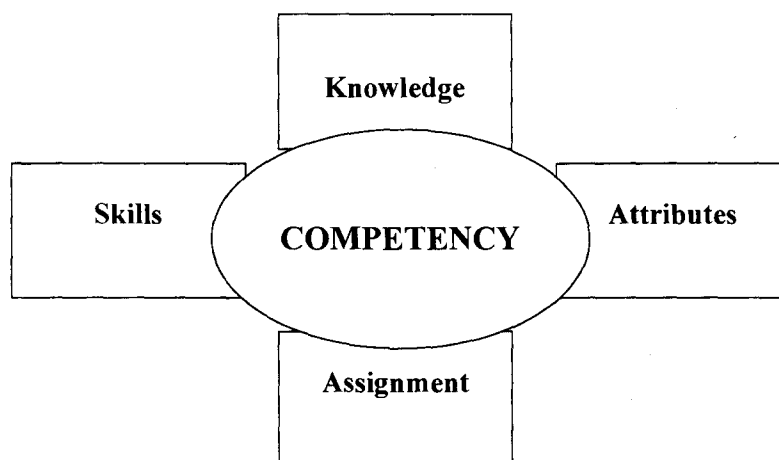


Figure 1 - Elements that constitute the competency of a P2 facilitator.



Competency	Performance Criteria	Evidence Guide
1: Understand the application of the principles, procedures and techniques of auditing 	1.1: The principles, objectives and techniques of auditing management systems, as outlined in ISO 19011:2002, are understood and applied.	In accordance with ISO 19011:2002 guidelines, with omission or deviation justified Presented verbally, written or other via means; accurate, concise and within context. The evidence of 'understanding' must be measurable and relate directly to the requirements of the Standard. *****
	1.2: The terms and definitions of ISO 19011:2002 are understood and applied.	Understanding of the auditing principles and practices as identified in ISO/IEC19011:2002 is demonstrated. Correct use of terms and definitions of IEC19011:2002 is demonstrated.
	1.3: Audit criteria relevant to the auditee's business and operation are identified.	Relevant audit objectives, scope and criteria are accurately defined. The issues affecting the feasibility of an audit such as information requirements, auditee co-operation, and resource availability are identified.
	1.4: An audit plan is developed to meet the agreed audit criteria.	A document review within the audit criteria is conducted with omission or deviation justified and appropriate actions communicated to the auditee. On-site audit activities are planned and a written audit plan is prepared, including an audit timetable that accurately reflects the achievement of the audit objectives within the agreed or prescribed timetable.
	1.5: A document review is completed.	An audit checklist, or other relevant work documents, that conforms to the requirements of the reference standard is developed.
	1.6: All aspects of the on-site audit activities are understood and applied.	

Figure 2 – Collation of Knowledge Competency Based on the RABQSA Model.

It is important to consider the typical P2 assignments and determine how to prepare the P2 facilitator for this work. This specialist works closely with the organization's employees to identify, evaluate, recommend and assist in implementing source reduction practices that result in the elimination of waste, regulatory compliance requirements and unnecessary costs associated with the process prior to its improvement. Among the assignments are the following:

- Conducting process mapping with confirming facility assessments
- Verifying information with employees and seeking their opinions on opportunities to improve the processes
- Involving management in the prioritization of opportunities to improve the process
- Facilitating employee team P2 projects using root cause analysis, brainwriting of potential P2 alternatives, bubble sorting to prioritize the alternatives and the preparation of an action plan for management review and implementation

- Researching existing and new technologies to supplement the knowledge of the employees and management in the facility
- Coordinating P2 awareness activities
- Ensuring regulatory compliance
- Establishing partnerships and building a strong P2 program
- Measuring P2 program effectiveness and contribution of value to the organization
- Fulfilling administrative responsibilities to sustain the P2 program.

A P2 facilitator should have the following skills:

- Apply P2 principles, procedures and techniques
- Plan and organize the P2 assessment and program effectively
- Prioritize and focus on matters of significance
- Collect process and input/output information through process mapping and resource accounting
- Interview, listen, and observe the people involved with the process

- Review documents, records and data
- Understand the appropriateness and consequence of stepping out of their facilitation role
- Verify the accuracy of collected information
- Confirm the sufficiency and appropriateness of the information and other best practice information
- Assess those factors that can affect the reliability of the P2 projects
- Maintain the confidentiality and security of information
- Communicate effectively.

Most of these are skills which need to be developed during the CBT efforts.

Advantages of CBT

One of the advantages of CBT is that the focus of the training is on the success of each P2 facilitator enrolled in the class. It is particularly useful when the training participants already have some knowledge of P2. Information is readily available on a variety of different P2 web sites. The key benefits of CBT include:

- Participants will achieve competency required in the performance of their P2 facilitation activities
- Participants build their confidence as they succeed in mastering specific competencies
- Participants can receive a transcript that lists the specific competencies that they have achieved through the training
- Training time is used more efficiently and effectively as the trainer is a guide to learning as opposed to a provider of information
- Much more of the time is devoted to working with the course participants individually or in small groups as opposed to presenting lectures
- More training time is devoted to evaluating each participant's ability to perform essential job skills