

# **Driving Efficiency: Implementing the Federal Buildings Personnel Training Act at GSA**

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## **ABSTRACT**

The Federal Buildings Personnel Training Act (FBPTA) is an opportunity for the government to save money and improve its facility management workforce through consistent and rigorous training. Facility managers and operators of federal buildings can use it to learn how technology and proactive operations and maintenance strategies can reduce energy and maintenance costs. The resulting savings could be substantial. A study by Pacific Northwest National Laboratories (W. Hunt, 2002) found the government can cut energy costs between 5-30% through these practices. Applied across government this could add up to \$2 billion in annual savings. The core competencies, curriculum, and method to demonstrate compliance required by the Act must be applied to over 100,000 federal employees and contractors. This paper describes how the Act has been applied to facility management personnel within the General Services Administration (GSA). It shows how GSA's Facility Management Institute (FMI) has laid the foundation for a talent management system with the Skills Assessment Web Tool which allows individuals with no knowledge of the FBPTA to identify gaps and training to fill them in less than an hour. It discusses how government, industry and academia continue to work together to improve the quality of training for the government's facility management workforce. It closes with a discussion on how these efforts may lead to a flexible training curriculum based on the foundation of an accredited, high-quality, web-based certificate and leading to advanced industry-based certifications or academic degrees for career progression.

## **Matching the FBPTA Core Competencies to Various Roles**

As required by the Federal Buildings Personnel Training Act, GSA developed a set of core competencies to be used by all federal agencies. This "competency model" for facility managers is shown in Figure 1 below. The model provides a consistent and comprehensive structure for what a facility management organization must know and be able to do to achieve the desired efficiencies. A few of the competencies were deemed especially important to cost reduction. These "high-priority" competencies are identified in red text. The competencies highlighted in yellow consist largely of information unique to operating federal facilities. These are often called "Federal References" by FMI. FMI's 2013 Annual Update gives greater detail.

Individuals must address the parts of the model that apply to the work they do. No one person must comply with the entire model. Rather, the organization as a whole must cover the model completely. Figure 1 shows how facility management, energy management and building operator roles can align to do this. Each agency must define an approach for its organization. The diversity of facility management organizations, human resource planning, and labor agreements across federal agencies make it impractical to provide uniform instructions for this. Instead, the figure provides high-level guidance for agencies to apply the model to their own organizations.

FBPTA Competency Model														
Comp Area (12)	Core Competency (43)	Facility Mgt	Energy Mgt	Building Ops	Comp Area (12)	Core Competency (43)	Facility Mgt	Energy Mgt	Building Ops	Comp Area (12)	Core Competency (43)	Facility Mgt	Energy Mgt	Building Ops
1. Management of Facilities Operations & Maintenance				5. Safety				10. Business, Budget and Contracting						
	Building Systems					Basic Requirements					Total Cost of Ownership			
	Building Interior					Infrastructure					Life Cycle Assessment			
	Building Exterior					Contractor Program Oversight					Contracting			
	Other Facility Systems					Occupant Interface					Budget Formulation and Execution			
2. Performance of Facilities Operations & Maintenance				6. Design				11. Leadership and Innovation						
	HVAC Systems					Planning					Communication			
	Electrical / Mechanical Systems					Infrastructure					Personnel			
	Life Safety Systems										Innovation			
	General Building Maintenance					7. Sustainability					Enterprise Knowledge			
	Best Practices & Innovation					Regulations and Requirements								
						Implementation								
3. Technology				8. Water Efficiency				12. Performance Measures						
	Technology Solutions					Regulations, Goals and Best Practices					FBPTA			
	Building Automation Systems					Water Audits					Acquiring Data			
	Maintenance Management Systems										Establishment and Implementation			
4. Energy Management				9. Project Management										
	Demand Reduction					Initiate								
	Assess Initial Conditions					Execute								
	Commissioning and ESPC					Closeout								
	Coordinate with Public Utilities					Training								
	Planning, and Project Management													

Figure 1. The FBPTA Competency Model, and, a general guide on how to apply it to an organization.

GSA’s approach to applying the model to its own organization can serve as an example to other agencies. Assigning new responsibilities and assessing skills with existing positions is a challenging process that requires close coordination. Figure 2 below indicates how GSA tapped subject matter experts from Agency Practitioners serving on an Educational Governance Board, Office of Human Resources Management (HRM) and FMI to carry out this effort. A working group reviewed the broad roles shown in Figure 1 and identified six positions impacted by the FBPTA. Property and Lease Managers make up 80% of staff assigned to those. The remaining positions are performed by regional office staff with specialized roles and responsibility for a larger number of buildings. The impacted positions are as follows:

- Property Managers
- Lease Administration Managers
- Energy Managers
- Asset Managers
- Fire Life Safety Experts
- Environmental Compliance Experts

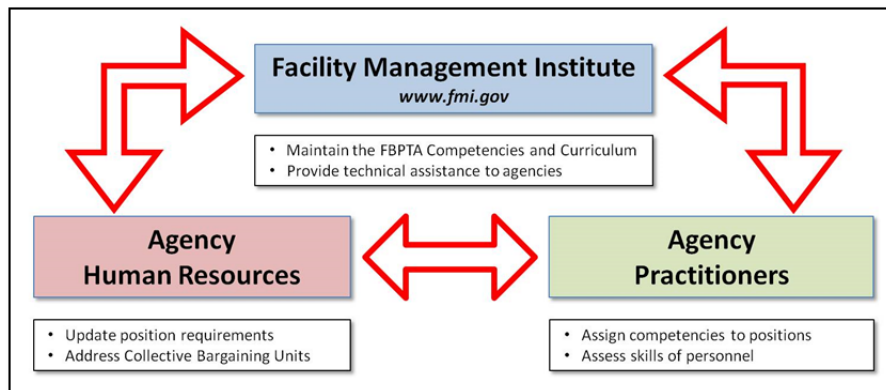


Figure 2. Roles and responsibilities for implementing the FBPTA within an agency.

To ensure every competency is covered by someone in the organization, GSA compared the six positions side by side in GSA’s Skills Assessment Web Tool. In Figure 2 below, four positions cover most of the Technology competencies. However, the report shows a flag “Unsatisfactory Rows!” since the requirement to “Conduct Troubleshooting of Critical Systems” is not covered by any of the positions. It was later assigned to a different position to complete coverage. Templates were then built to capture the requirements and ensure there were applied consistently across GSA.

Unsatisfactory Rows! Technology ▼

Performance	Energy Management (GS11-12)	Fire Life Safety (GS11-12)	Property Manager (GS11-12)	Property Manager (GS13-15)
<b>Technology Solutions</b>				
Monitor Information and Trends	Yes	No	Yes	Yes
Identify and Interface with Accountable Resources	Yes	No	Yes	Yes
Identify, Evaluate, and Recommend Technologies Solutions	Yes	No	Yes	Yes
Assess Impacts of Changes to Facility Management Technologies	Yes	No	Yes	Yes
Plan For and Oversee Changes to Components Supporting Facility Management Technologies	Yes	No	Yes	Yes
Establish, Recommend, and Communicate Policies, Practices, and Procedures	Yes	No	Yes	Yes
Develop and Implement Training Programs	Yes	No	Yes	Yes
Monitor Performance of Facility Management Technologies	Yes	No	Yes	Yes
Manage Corrective, Preventative, and Predictive Maintenance	Yes	No	Yes	Yes
Develop, Test, and Implement Emergency Procedures and Disaster Recovery Plans	No	Yes	Yes	Yes
<b>Building Automation Systems (BAS)</b>				
Knowledge of BAS and MMS	Yes	No	Yes	Yes
Understand the Bridge between Technical and Business Aspects	No	No	Yes	Yes
Conduct Troubleshooting Procedures	Yes	No	Yes	Yes
Conduct Troubleshooting of Critical Systems	No	No	No	No
<b>Maintenance Management System (MMS)</b>				
Knowledge of CAFM and CMMS	No	No	Yes	Yes
Operate MMS and CMMS	No	No	Yes	Yes

Figure 3. Each position in an organization plays a role in covering all of the FBPTA core competencies.

The Educational Governance Board created several working groups to help formalize the new requirements in human resources documents. These groups used the high-priority competencies to pare down the model to a subset of the most important items. This subset focuses on best practices for O&M, application of technology including Building Automation Systems, assessing demand reduction opportunities, implementing sustainability programs and using life cycle cost analysis in budgeting. They add significant technical capability to the property manager position. In the government, this process must start with Pre Decisional Involvement (PDI) or engagement with unions. GSA’s unions were notified of the need to

assess individuals and were invited to participate in defining how the new requirements would be applied to the position.

## **The Foundation of a Talent Management System**

Individuals must demonstrate compliance with the FBPTA core competencies for which they are responsible. Agencies must track progress for these individuals and collectively. GSA developed the Skills Assessment Web Tool to make it easy to comply. The Web Tool helps individuals discern their requirements, find where they have gaps and identify training resources to fill them. Any federal employee may create an account and use the Web Tool. All that is required is to select the competencies required by their position and to select training that they have completed in their career from a list of FBPTA-Aligned resources. After these two steps, they are given an analysis which identifies skill gaps and provides links to qualifications that will fill them. The Web Tool does not track experience or conduct tests of skills directly. However, future versions of the Web Tool will allow agencies to define and track practical exercises to reinforce training with experience, and, many of the qualifications provided by industry associations require experience and a formal, comprehensive exam. With the current version of the Web Tool, an individual can go from no knowledge of the FBPTA or Skills Assessment Web Tool to having targeted suggestions for training in less than an hour. An online tutorial and instruction manual are provided on the Web Tool's welcome page.

Figure 4 shows how the Web Tool is designed to stimulate a conversation between individuals and their supervisors. Once an employee completes their input, supervisors can review the results to see what is still required, and what has been completed by FBPTA-Aligned training resources ("Complete – FBPTA Aligned"). A supervisor can add on the job training ("Complete – Agency OJT") as well as give credit for other training GSA has not yet placed on the FBPTA-Aligned list ("Complete – Agency Training"). The Web Tool records basic information about method and completion date that can be easily retrieved as shown in Figure 4 below. The gap analysis provides individuals and supervisors a basis for discussing career development. It can help identify and prioritize areas to address and record what steps are taken when. It can be used whether or not an agency has provided detailed guidance or instructions for implementation of the Act.



Status	2.5 Best Practices and Innovation Competencies	
Required ▼	2.5.1	Demonstrate knowledge of the "Ten Steps to Operational Efficiency" <i>FEMP O&amp;M Best Practices Guide Rev 3.0 pg 291.</i> <a href="http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf">http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf</a>
Complete - Agency OJT ▼ 	2.5.2	Demonstrate knowledge of (DOE/PNNL) "Retuning Project" and how it could be applied. <a href="http://www.pnnl.gov/buildingretuning/">http://www.pnnl.gov/buildingretuning/</a>
Required ▼	2.5.3	Demonstrate knowledge of and ability to perform "predictive maintenance." <i>FEMP O&amp;M Best Practices Release 3.0 pg 5.9.</i> <a href="http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf">http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf</a>
Complete - FBPTA-Aligned ▼	2.5.4	Demonstrate knowledge of ALL types of commissioning and what is required in the Energy Independence and Security Act 2007 (EISA). <i>FEMP O&amp;M Best Practices Release 3.0 pg 7.1 AND EISA SEC 432.</i>
Complete - FBPTA-Aligned ▼	2.5.5	Demonstrate knowledge of metering and sub-metering for energy and water and how they contribute to systems optimization.
Complete - Agency Training ▼ 	2.5.6	Demonstrate knowledge of O&M Frontiers like those found in <i>FEMP O&amp;M Best Practices Guide Rev 3.0 pg 287.</i> <a href="http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf">http://www1.eere.energy.gov/femp/pdfs/omguide_complete.pdf</a>
Complete - FBPTA-Aligned ▼	2.5.7	Demonstrate knowledge of advanced troubleshooting techniques on a systems-wide basis.

Figure 4. The Web Tool structures a conversation between employee and supervisor about required skills and gaps.

Agencies that elect to use the Web Tool can roll up individual data for agency-level tracking. GSA uses the Web Tool to track results for 1,400 individuals. Dashboard reports give snapshots of progress and identify the most commonly-selected qualifications. These help track progress and highlight where agency training resources are currently being spent. The Web Tool provides detailed reports which are being used to identify training gaps, develop training strategies, and request resources. Figures 5 and 6 show the results from the most recent assessment of GSA's property managers. Figure 5 shows which qualifications were most often completed by this group. Figure 6 shows where GSA has gaps aggregated across each of the FBPTA competency areas. Note that only those "FBPTA-Aligned" qualifications formally reviewed against the Act's requirements have been included in this assessment. On the job experience and specialized training such as that provided for project management, contracting and leadership have not been considered and will fill many of the competencies shown as required. Future assessments will allow individuals to enter these under "Complete – Agency OJT" and Complete – Agency Training." This data was then filtered to show compliance at the granular "performance" level and to show compliance with the high priority competencies.

With this knowledge, GSA will focus future training efforts on gaps in high-priority areas. These include greater emphasis on the use of Building Automation Systems for troubleshooting and optimization, familiarity with unique requirements for energy, water and sustainability in federal facilities, identification of water conservation opportunities, familiarity with sources of information on innovation in the facility management profession, and command of life cycle cost analysis and life cycle assessment concepts. The agency is using this information to work with its FBPTA-Aligned training providers to enhance popular qualifications to address these needs. The agency is also working to identify specialized training resources to target specific gaps in high-priority competencies directly.

The Web Tool provides a basic level of functionality for a talent management system. GSA will continue to make it more robust. In the coming year GSA will explore options to allow agencies to customize the Web Tool and track requirements beyond the FBPTA. It will

also create automatic recording of attendance and completion data in outside learning management systems. This will automatically give credit to individuals completing courses and credentials meeting FBPTA requirements.

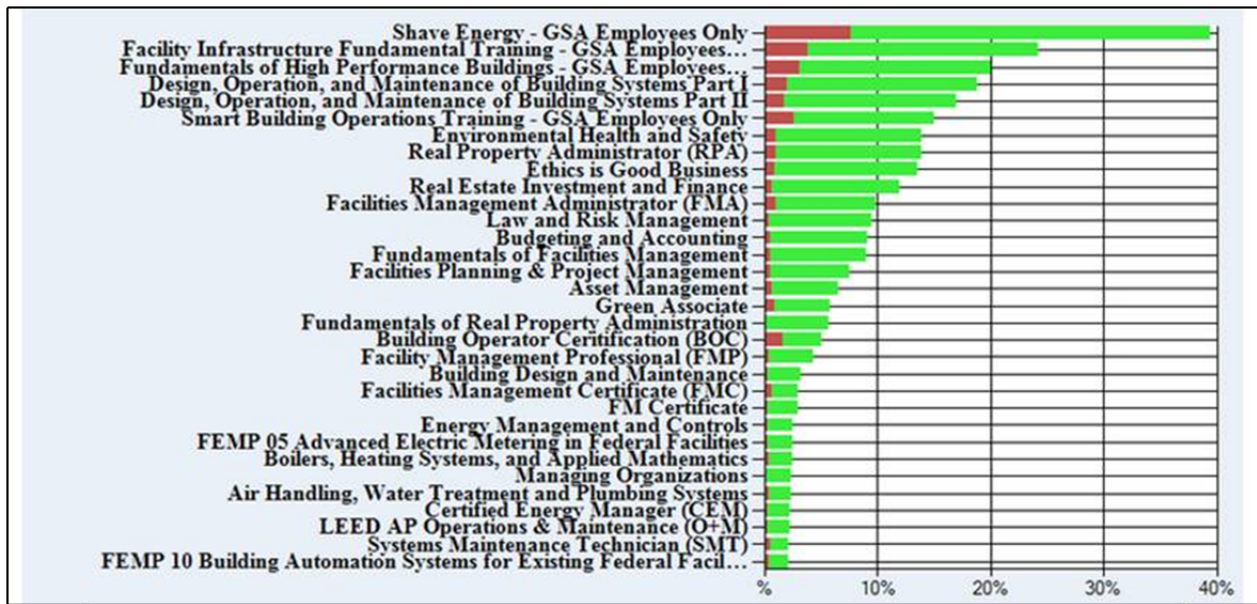


Figure 5. Qualifications completed by GSA employees - most to least common.

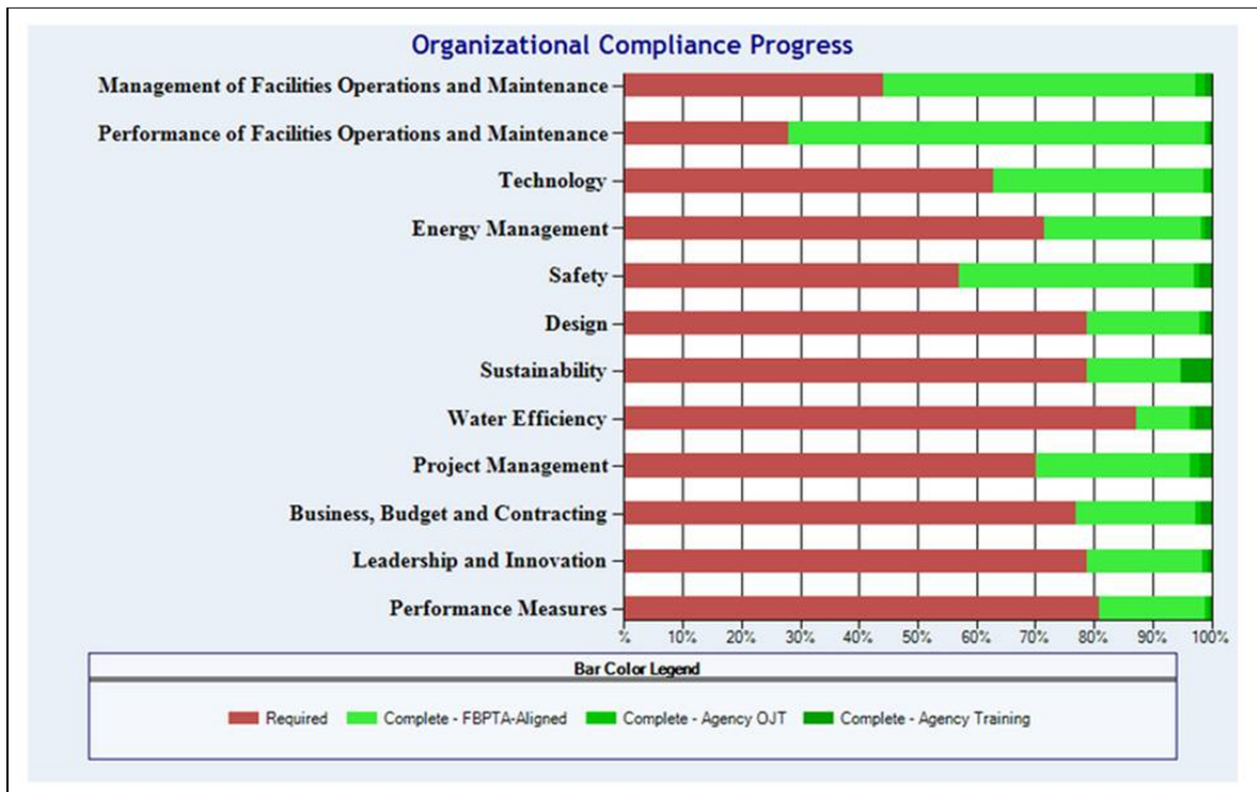


Figure 6. Compliance progress by GSA Property Managers; only “FBPTA-Aligned” qualifications considered.

## **Industry, Government and Academia Partnering to Improve Facility Management**

Within government, GSA uses the competency model to identify qualifications that federal employees can use to comply with the Act. More than 100 unique qualifications have been reviewed to date. Once reviewed they receive a status as “FBPTA Aligned” indicating they align with specific competencies at a level appropriate to the intended audience of Facility Management, Energy Management or Building Operator. These credentials provide a clear path toward compliance for federal personnel as shown in Figure 5 below. The number of FBPTA Aligned qualifications will increase as GSA is able to review them.

The process GSA follows to review qualifications provides full transparency and allows for public comment. It works as follows:

1. The training providers fills out a form available on FMI.gov
2. The form is reviewed by a third-party contractor to GSA
3. GSA and the provider discuss and reach agreement on the review
4. GSA posts the results on FMI.gov for public comment
5. GSA adds the “FBPTA-Aligned” qualification to the Curriculum and Web Tool

In addition to reviewing existing training, GSA has used this process to communicate federal training needs to providers. Discussions with professional associations, academic institutions and government training providers have focused on understanding how existing resources address the competency model. In some cases, particularly where competencies identified as high-priority are not addressed, GSA has suggested modifying or expanding existing content. Several competencies involve knowledge of regulations, processes or references unique to the federal government. It is understandable that an industry body with a global focus would not cover such proprietary information. Figure 7 gives an example of how GSA and industry providers are using the competency model to identify requirements for adding content around life-safety and general building, occupant safety, life cycle assessments and implementation of performance measures to credentials. Discussions on the exact changes that will be made are still in process so specific details are not available at this time. GSA has placed a priority on credentials most commonly sought by its employees. Similarly, the review process helps make training providers familiar with the model allowing them to suggest changes to it. Prompted by these interactions, GSA is considering changes to better define the role of a facility manager in emerging standards for energy management systems defined by ISO 50004. The Act envisioned exactly this sort of partnership between government, industry and academia.

Hypothetical "FBPTA-Aligned" Credentials								
Comp Areas (12)	Core Competencies (43)	Certification XXXX	Comp Areas (12)	Core Competencies (43)	Certification XXXX	Comp Areas (12)	Core Competencies (43)	Certification XXXX
1. Management of Facilities Operations & Maintenance			5. Safety			10. Business, Budget and Contracting		
	Building Systems			Basic Requirements			Total Cost of Ownership	
	Building Interior			Infrastructure			Life Cycle Assessment	???
	Building Exterior			Contractor Program Oversight			Contracting	
	Other Facility Systems			Occupant Interface	???		Budget Formulation and Execution	
2. Performance of Facilities Operations & Maintenance			6. Design			11. Leadership and Innovation		
	HVAC Systems			Planning			Communication	
	Electrical / Mechanical Systems			Infrastructure			Personnel	
	Life Safety Systems	???		7. Sustainability			Innovation	
	General Building Maintenance	???		Regulations and Requirements			Enterprise Knowledge	
	Best Practices & Innovation			Implementation			12. Performance Measures	
3. Technology			8. Water Efficiency			FBPTA		
	Technology Solutions			Regulations, Goals and Best Practices			Acquiring Data	
	Building Automation Systems			Water Audits			Establishment and Implementation	???
	Maintenance Management Systems	???		9. Project Management			Legend	
4. Energy Management				Initiate				Fully aligned with FBPTA Core Competency
	Demand Reduction			Execute				Partially aligned with FBPTA Core Competency
	Assess Initial Conditions			Closeout			???	Not aligned, candidate for future addition
	Commissioning and ESPC			Training				Significant "Federally-Specific" content
	Coordinate with Public Utilities							High-priority/high-value, impacts cost / efficiency
	Planning, and Project Management							

Figure 7. A credential that aligns well with FBPTA competencies can still be improved.

In its first interpretation, GSA took a narrow view of compliance. Government and industry are now working together to broaden that view. GSA prefers a method that will establish both an acceptable minimum requirement for all workers and clear incentives for professional development to individuals and organizations. DOE, GSA and the National Institute of Building Sciences (NIBS) are working on a high-quality, no-cost, basic certificate for federal facility managers and federal contractors. The certificate will meet the minimum requirements of the FBPTA and instill a basic understanding of the knowledge and skills that lead to cost savings and requirements unique to federal facilities. The certificate program will not compete with or replace private-sector credentials. It will provide the “first rung” on a career ladder for qualified workers that lays a foundation for more advanced training and increases demand for higher-level credentials from recognized industry bodies. Organizations seeking federal contracts could differentiate themselves by the extent to which employees have met the basic qualification and additional higher level qualifications approved by GSA.

## A Mandatory Early Career Certificate Leads to Industry-Based Certifications at Senior Levels

The Better Buildings Workforce Guidelines project is working through the NIBS Commercial Workforce Credentialing Council (CWCC) to define the requirements for this certificate. This approach recognizes the challenge of providing consistent workforce development across a diverse landscape of facility management organizations, geographic locations, agency financial resources and personal inclination to advance. Establishing a free or low cost online FBPTA Certificate will establish a minimum standard that can reach the broadest possible audience. Online training can be done quickly and according to an individual’s schedule. It can reach remote locations without the cost of travel or loss of large blocks of availability of personnel. More information is available on this effort, which impacts a number of other energy-related fields on the CWCC website.

The basic certificate will address critical aspects of Facility Management at a level appropriate to someone in their early career. The CWCC convened a group of federal and private sector subject matter experts to validate the FBPTA competencies assigned as high priority and develop a Job Task Analysis (JTA) and set of Learning Objectives designed for a



facility manager at the start of their career. The JTA and learning objectives will now be used to develop a certificate scheme that can be accredited under the IREC 14732 standard. A government sponsored certificate program may be formed by adapting and expanding existing training content available through the Federal Energy Management Program (FEMP) and NIBS Whole Building Design Guide. The certificate scheme may also be used by professional associations and academic programs to develop low-cost variations. These products could fill the minimal FBPTA requirement and provide credit toward their own more advanced programs. Figure 8 shows how this basic certificate begins a career progression supported by a wealth of focused training for facility managers.

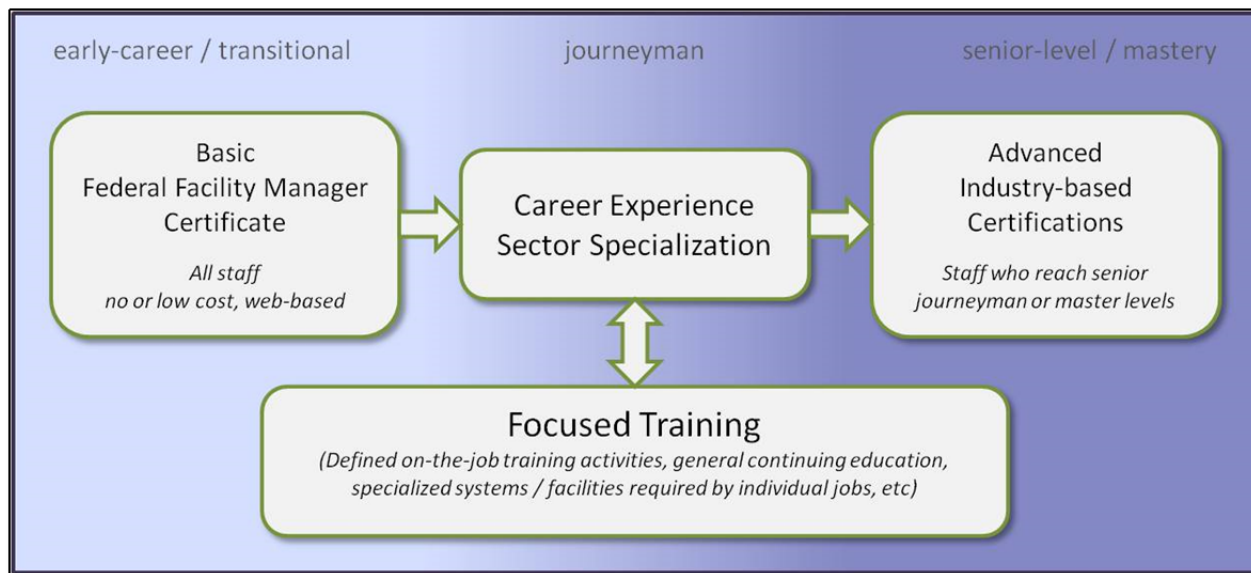


Figure 8. A basic certificate in early career leads to advanced industry certification for senior personnel.

Focused, in-depth training and practical application at the local level should be required to enhance and deepen career development. GSA has defined 18 specific on the job training tasks in high-priority areas. They require individuals to complete and review specific tasks with supervisors or a designated mentor. GSA developed the Shave Energy training program to help its property managers manage building set points and operating hours, respond to building tuning issues, and recognize low-cost opportunities to reduce energy use. This training aligns well with the PNNL Building Retuning training that teaches building operators to use operating data available through Building Automation Systems and physical inspections of equipment to identify energy savings opportunities through improved operations. GSA employees are encouraged to take Retuning after completing Shave Energy. New O&M contract language requires all contractor staff to take Retuning within 6 months of contract award. GSA is now piloting a process to incorporate the Building Retuning into the periodic audit cycle performed by the Energy Division within its National Capitol Region. The Energy Manager, Property Manager and O&M contract site manager would take the online version of the Retuning, analyze building data for operational savings opportunities and then conduct a walk-through of the site. If successful, this process will allow energy managers to leverage online training and practical experience to build the required expertise for property managers to properly maintain cost savings in the years between audits.

Additional specialized training is available through subscriptions to Learning Management Systems and available free from industry groups and manufacturers. The National Electrical Manufacturers Association created a free clearinghouse of industry-created training that has been indexed to the FBPTA Competencies. This provides a source of continuing education topics on specific technical standards or equipment that employees may have on site. The volume of training available makes mapping under the existing evaluation system impractical. However, GSA's Skills Assessment Web Tool can track where individual training is used repeatedly for "Complete 3" credit in specific competencies. As data is gathered, popular and highly rated training will be added to GSA's curriculum. Training providers are encouraged to visit [www.fmi.gov](http://www.fmi.gov) to understand how training resources can be submitted to GSA for review and inclusion on the Web Tool.

Most of the qualifications evaluated by GSA to date have been higher-level credentials issued by industry associations and academic institutions outside traditional degree programs. These certifications play an important role beyond providing training. Certifications generally have requirements for experience, completion of a comprehensive exam, continuing education, and periodic re-certification. The industry association takes on the burden of credentialing management and typically creates a community of practice for individuals. The breadth of such credentials extends across many specialized facility types allowing individuals the flexibility to develop beyond the skills of the basic certificate into more specialized roles demanded by the types of facilities the manage.

Finally, traditional academic programs may play a larger and more direct role in Facility Management. An increasing number of academic institutions are developing bachelor and master level programs in Facility Management. Some, like the Catholic University of America, are using the FBPTA as a basis for significant portions of their curriculum. As federal facility managers retire or leave civil service these programs have the potential to fill a large demand for well trained replacements. Their advanced degrees provide higher level training for a natural career progression.

## **Conclusion**

The FBPTA is an opportunity for the federal government to accelerate the development of the facilities workforce and save money on operations. Applying the Act and assessing individuals requires an effort on the part of individuals and agencies that will yield significant long-term benefits. The Act is being used to define a low-cost pathway to a basic level of qualification for all employees and a roadmap to higher certification for those who want to advance in their careers. The Facility Management Institute of GSA is ready to assist those ready to take advantage of this opportunity.

## **References**

W. Hunt, G. S. (2002). Assessing the Potential for a FEMP Operations and Maintenance Program to Improve Energy Efficiency. Pacific Northwest National Laboratory.