
Competency Models In Action:

National Manufacturing Industry Association Creates Stackable Credentials

February 2016

- Working with industry and educators to identify requisite worker skills for manufacturing occupations
- Providing workers with portable, modular credentials as they progress in their career paths
- Developing competency-based mechatronics National Guidelines for Apprenticeship Standards

Introduction

Manufacturing employers are facing the conundrum that many other industry sectors need to address in today's workplace: Incumbent workers are retiring at record levels, new entrants to the workforce lack the necessary skill sets to successfully replace them, and the use of advanced technology is increasing the skill levels needed by both incumbents and new workers.

In response to this dilemma, the Association for Packaging and Processing Technologies, formerly known as the Packaging Machinery Manufacturers Institute (PMMI), a sponsor of the U.S. Department of Labor, Employment and Training Administration's (ETA) Mechatronics Competency Model, has developed a certification architecture with stackable credentials that correlate to that model. This initiative helps manufacturing employers identify skilled workers and enables educational institutions to develop curriculum to prepare students for these occupations.

The Workforce Need

A 2015 Manufacturing Institute and Deloitte Skills Gap Study found that 84 percent of manufacturing executives surveyed agree that there is a talent shortage in U.S. manufacturing. Moreover, six out of ten executives surveyed indicated that open skilled production positions go unfilled due to a talent shortage even when 80 percent of manufacturing companies were willing to pay more than the market wage rates for workforce positions reflecting this talent shortage. The study also projected that, over the next decade (2015 - 2025), 3.4 million manufacturing jobs will need to be filled due to 2.7 million "baby boomer" retirements and 700,000 new manufacturing jobs are expected to be created from the economic recovery.¹

For example, according to the Bureau of Labor Statistics, the outlook for industrial machinery mechanics and machinery maintenance workers is very positive. It is anticipated that

¹ Real Clear Markets,
http://www.realclearmarkets.com/articles/2015/02/09/putting_us_manufacturing_growth_in_perspective_101525.html

employment will increase by 16% between 2014 – 2024, much faster than the 10.8% average for all occupations. The median pay for these occupations was \$47,450 per year in 2014.²

Approach

In 2008, PMMI collaborated with the Mid-Atlantic Mechatronics Advisory Council, an industry group representing end user and equipment manufacturers as well as PMMI member companies and schools to address the issue of skills shortages in the manufacturing workforce. “We wanted to see what these companies would need five years out, not just tomorrow,” says Keith Campbell of Campbell Management Services, LLC and Editor, Manufacturing Workforce Development Playbook. As the group fleshed out the skill sets, they determined that mechatronics was the best way to describe the complete set. They agreed on the following definition of mechatronics: the synergistic application of mechanical engineering, electrical engineering, controls engineering and computer science to create useful products.³

Based on the original work done in 2008, PMMI took a leadership role in identifying the necessary skills workers must possess, customized for the manufacturing segment where the majority of packaging and processing companies operate. The organization recruited subject matter experts from industry as well as educators to help develop each certification test. In recognition of the need to develop a set of credentials that would be meaningful and adaptable to the packaging and processing industry, it was decided that this certification system should be modular – namely that a professional working the field would only need to take test relevant to their position at any given time in their career. They could add additional certifications as needed as their job responsibilities increased.⁴ “The certification test differentiates the skills that employers need and that educational institutions can provide,” says Stephan Girard, Director of Workforce Development, PMMI. “Our focus is on preparing industrial maintenance technicians, who are multi-disciplined and multi-skilled as verified by our mechatronics certification tests.

“These are nationally-recognized third party certifications,” says Mr. Campbell. “The detailed competencies for each test are available on the PMMI website and curriculum developers across the country are able to use this information to develop the training that the packaging, processing and other manufacturing industries are seeking. The first three levels of the program’s credentials stack to the technical content of an in-depth associate degree from which an individual could articulate up to 65 credits to a university engineering program.”

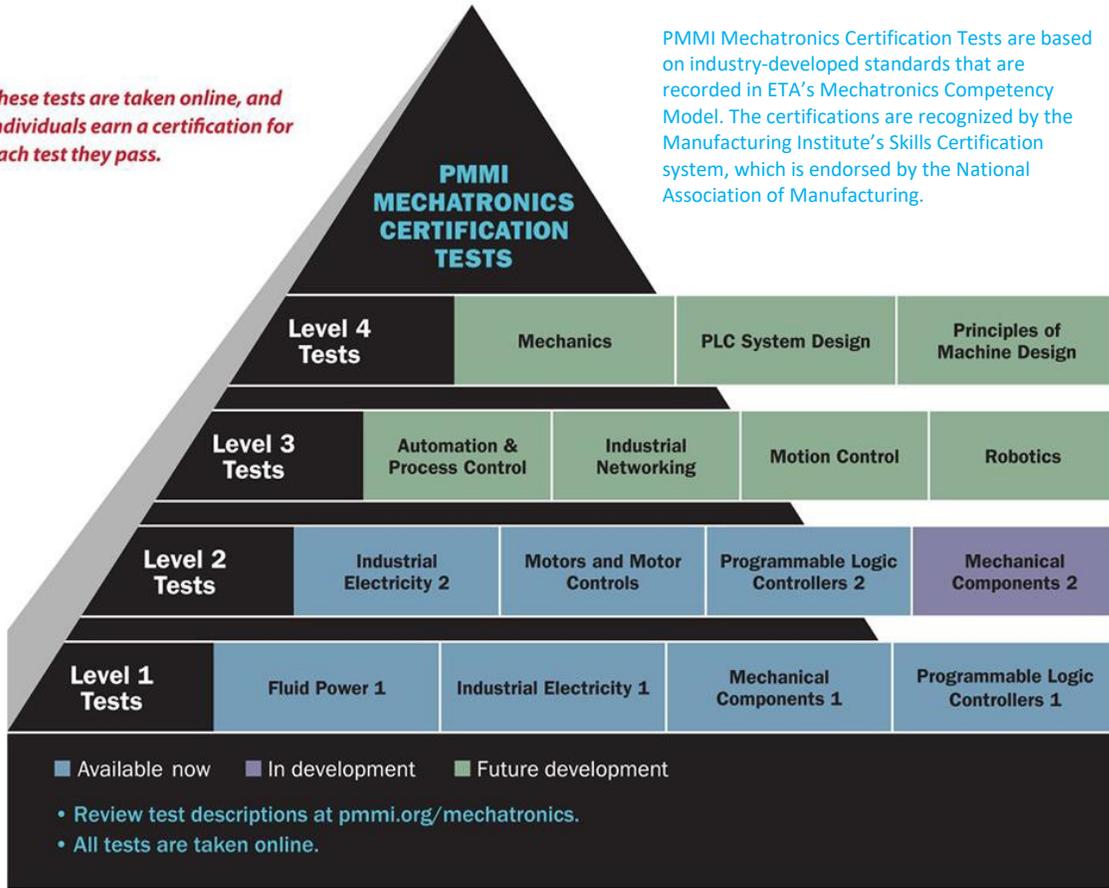
² Bureau of Labor Statistics, Occupational Outlook Handbook, 2014-2015 Edition

³ Manufacturing Workforce Development Playbook, Second Edition, Revised for 2016, Chapter 14

⁴ Ibid

These tests are taken online, and individuals earn a certification for each test they pass.

PMMI Mechatronics Certification Tests are based on industry-developed standards that are recorded in ETA's Mechatronics Competency Model. The certifications are recognized by the Manufacturing Institute's Skills Certification system, which is endorsed by the National Association of Manufacturing.



“The PMMI Mechatronics certifications also constitute the foundation of the National Guidelines for Apprenticeship Standards for Mechatronics Technicians occupation which were certified by ETA, Office of Apprenticeship in November 2014,” says Mr. Girard. “These guidelines are distinguished from traditional apprenticeships because they are competency-based rather than time-based. The certification tests are used to confirm the apprentices’ knowledge and skill as they move through each learning objective of the program. Companies have the option of registering the apprenticeship with ETA, Office of Apprenticeship or they can use the guidelines as a roadmap to develop their own training programs.”⁵

Next Steps

PMMI has completed eight of the 23 certification tests originally identified, completing the foundational elements in Levels 1 and 2, and continues the test development process year-round. PMMI is also working with schools around the country to educate them about the program and encourage them to develop curriculum to prepare students for these tests.⁶

⁵ Manufacturing Workforce Development Playbook, Second Edition, Revised for 2016, Chapter 15

⁶ Manufacturing Workforce Development Playbook, Second Edition, Revised for 2016, Chapter 14

Related Links

The Association for Packaging and Processing Technologies

<http://www.pmmi.org/mechatronics>