Best Practice #73
Energy Systems Technology and Education Center

Facility: Idaho National Laboratory

Best Practice Title: Energy Systems Technology and Education Center

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Brief Description of Best Practice:

Idaho National Laboratory, Idaho State University and Partners for Prosperity (a not-for-profit agency chartered with reducing poverty in Eastern Idaho) teamed to create this market sector driven learning center on the Idaho State University campus. The Center is providing 5 Associate of Applied Science degrees in energy systems in the areas of Instrumentation and Control, Electrical Engineering Technology, Mechanical Engineering Technology, Wind Power Technology and Nuclear Operations Technology (in Fall 2010). Driving forces behind the Center are providing an energy systems-specific education and improving workforce diversity in the energy sector.

Why the Best Practice was used:

Studies conducted by the Center for Advanced Energy Studies in 2004 indicated that while engineers would be one critical shortage in the energy workforce picture, technicians were even more critical. Very few educational programs existed nation-wide to address the impending mass retirement in the energy market sector. Also noted was the need to diversify the employee population in the market sector in both the maintenance and operations ranks. The Idaho National Laboratory facilitated the creation of a partnership with the university and the social service organization with the express intent of pursuing grants to create the center and to package one of the curricula for use by other professional technical institutions. A Department of Labor Community-based Job Training Grant and a National Science Foundation Advanced Technological Education Grant were applied for and successfully secured. Further contributions from the State of Idaho, Idaho State University as well as a host of national and international industry partners resulted in a Center valued in the range of ~$30M. This approach was used to bring industry, government, academia AND a social service organization to the same table to create a shared lexicon concerning energy workforce needs and workforce development resources including the inclusion of the unemployed, underemployed and under-represented populations. To date the program has seen a sharp rise in enrollment and opportunity for the Hispanic and female demographic.

What are the benefits of the Best Practice:

The most important benefit is the regional leveraging of resources to produce a population of energy systems maintenance and operations technicians that have proven to perform (according to industry partner accounts) second to none. The Center

concept, as implemented, provides opportunity with considerations for culture and educational shortcomings in a sensitive and respectful manner. Opportunities for under-represented populations are real as are the partnerships between the between the Laboratory, University, Social Service Organization and Industry. These are not paper partnerships but face to face, get down to issues and understanding partnerships. The best practice puts a solid and successful example of how to knit together the relationship between education, employment and economic development. This approach also creates a well-defined pipeline for students leaving high school that are not bound for a traditional 4 year college education to enter an educational program that provides employment in a market sector paying high wages and providing good benefits. This program serves to break the cycle of poverty for many that enroll. It also serves the energy industries' desire to hire a diverse population.

What problems/issues were associated with the Best Practice:

Several issues have arisen in the course of deployment:

- It is difficult to hire experienced instructional staff given the significant gap between industry wages when compared to those in educational institutions. Pursuing those individuals that are close to retirement and want to live in Idaho has met with success but it has been a slow process.
- Identifying the facility that best allows for hands-on instruction needs to be committed early and ready for renovation as funds become available. Space is always at a premium.
- Hands-on, laboratory–based instruction while (we feel) is most effective, is also more costly than a lecture hall-based approach especially when teaching to specific high tech equipment. Instead of a 100 to 1 ratio in lecture, laboratory requires 20 to 1 at most. While this makes for a more successful graduate it is also expensive. Industry must help with this approach as it will drive their initial training costs down once they employ the graduates.
- Effective articulation of grade levels and connection to TechPrep Programs is an issue that has to be consciously addressed. This means making parents, students, teachers and counselors aware of the opportunities.

How the success of the Best Practice was measured:

The measures required by the Department of Labor and the National Science Foundation were used to determine program success. Typically these include graduation and placement numbers, salaries and long-term "promotability" of the students. These two agency reports are very detailed and provide an excellent accounting as to program and graduate success.

Description of process experience using the Best Practice:

Included in the curriculum is a great deal of safety culture development including the use of personnel protective equipment, actual use and maintenance of the lockout/tagout system in the Center's laboratory, introduction to error reduction techniques such as peer check/self check and brief insights into human error precursors/situational awareness/attention to detail.

Maintenance and operations curriculum include an overview of Conduct of Operations and Conduct of Maintenance principles.