
ABOUT THE AUTHOR

Richard L. (Ric) Rudman is senior vice president and chief operating officer of the Electric Power Research Institute (EPRI), the science and technology consortium for the electricity industry, in Palo Alto, California. He is responsible for developing and carrying out EPRI's business plan to meet corporate goals and members' expectations. The vice presidents of EPRI's five technical groups report to this position.

Mr. Rudman, who had been serving as EPRI's senior vice president of corporate services, rejoined EPRI in 1989 after two years as president and chief operating officer of Aster Publishing, a publisher of eight scientific business trade magazines. He originally joined EPRI in 1973 as assistant to the president, held increasingly responsible positions, and in 1983 became vice president of EPRI's industry relations and information services. His contributions in the past include creating a member services organization, developing technology transfer assistance for member utilities, upgrading the Institute's computer system to meet rapidly growing information needs, and leading the development of EPRI's Tailored Collaboration and Progressive Flexibility programs.

The author of numerous publications, Mr. Rudman holds a B.S. and M.S. in nuclear engineering from UCLA and has served on several technical and information exchange committees. In 1995, he was elected to serve as chair of the Council of Consortia, an organization of chief executive and senior officers from the nation's leading research and development and applied technology development consortia.

Developing A Long-Term Learning Strategy for Industry

Chuck Miles
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In today's radically changing world, we are often asked to do more, faster, with less resources. The rapid change prevalent today, driven by the world around us, affects the competitiveness of our organization and causes us to look for new ways to perform our duties within that orga-

nization. As professionals in the engineering field, specifically energy, proper training plays a vital role in our ability to fulfill job responsibilities and in developing our career. Continuous learning is a must in today's world.

Learning more about our building's HVAC systems, their operation, and how they deliver the environment necessary for the occupants of your building to be successful in their business is crucial to properly operating your facility and leads to reduced operating costs because of more efficient operations. Energy demands are reduced and expenditures are kept in check by implementing strategies learned in class to verify proper operating parameters. The improved maintenance resulting from increased skills results in extended equipment life, ensuring a greater return on equipment investments. This increased system up-time produces fewer occupant complaints allowing the operating staff to focus their efforts on being proactive and further tuning operations. Additionally, continuous learning increases staff ability to evaluate vendor recommendations to ensure they represent a sensible approach to building operation.

On a personal level, continuous learning helps employees gain skills to seize opportunities to add more value to the organization. This in turn prepares them to take on new tasks and challenges to further grow their careers. Properly skilled employees are more confident in their work and enjoy greater job satisfaction. And increased equipment maintenance and operation knowledge helps individuals understand and implement the maintenance goals established for their building.

DEVELOPING A LONG-TERM STRATEGY

To develop a long-term learning strategy for your organization, ask yourself, "Where is my organization's business headed? What skills do I need to support that business direction? What skills do my people currently possess? What skills do I need to develop in my staff?" The skills identified by your business opportunities should dictate your training needs. Then evaluate your current situation and concentrate on creating a plan to develop and enhance staff skills.

During this process, don't be afraid to compare your training plans with others who face similar situations regardless of their business. Using other organizations to benchmark your training plans, even though

they may not be in your industry, will allow you to expand your thinking and see your plan from a different perspective.

Once your long-term training strategy has been established, look for different ways to do things. Perhaps you might create a maintenance strategy that includes predictive, preventive and proactive maintenance as well as prescriptive maintenance to extend equipment life and reduce energy consumption. This could change the skill set you require for your organization. Read trade publications and surf the Internet to keep current with business and industry trends. Be prepared for changes by planning for tomorrow. Visualize the future and routinely evaluate your learning needs to ensure your learning strategy still supports these needs.

WHERE TO FIND TRAINING

But where do I get training? Training is available from a variety of sources, including product manufacturers, trade associations, technical and trade schools, and alliances of any of these. Most major equipment manufacturers offer maintenance training for their products. Many also offer generic training programs that include concepts that are not product specific, such as energy management techniques. Some manufacturers offer classes on basic maintenance strategies and techniques covering equipment from multiple vendors.

Accelerating change is the mark of society today. Every sector is stressed by it: the political, the economic, and of course, the technical area. The responsibility of keeping abreast of the expanding waves of change in our fields is a challenge—a mission—for trade groups which represent manufacturers and users, and for technical associations representing engineers and technologists. Trade associations, like the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) and the Association of Energy Engineers (AEE), hold conferences that include breakout sessions. These sessions often provide the latest technical information or case studies of successful implementations of specific maintenance and operation strategies. Other associations, like the Building Owners and Managers Association (BOMA), have established formal institutes that provide learning opportunities for their members.

Technical colleges and trade schools offer evening and weekend classes geared toward the non-traditional student; people who are cur-

rently part of the work force. These classes normally focus more on overall systems and operating and maintenance strategies rather than specific equipment or product. Many offer very flexible learning opportunities to accommodate the busy schedules of their working students.

By developing alliances between various educational forces, new opportunities for improving and extending technical training will emerge. Through such collaborative efforts efficiencies will improve, and resources will be used more wisely.

The three primary carriers of technical training and education, as reviewed in Dr. Winebrake's three-part series, are the public, private, and academic fields. Collaboration between these groups can evolve in different ways. One important development is the growing interaction between branches of local trade associations and chapters of technical societies, in the training process. We are starting to see combined group efforts to present seminars and other educational activities. And this concept is being extended more broadly, to regional educational efforts.

A public, private and academic alliance may come together to provide on-site training to several organizations in a regional area using trade association program funds and a minimal individual contribution. This type of training has advantages and disadvantages. With the training occurring locally, travel expenses for the participants are eliminated reducing the cost of the program. Localized training programs can more easily address specific local interests and increase networking which enables local benchmarking. Although the training can address specific local issues, because the attendees come from multiple companies with differing goals, it will not be able to address specific concerns of one organization.

Partnerships might also be formed between private and academic organizations. Let's look at two such alliances to examine the benefits to each organization. In 1986, the Milwaukee School of Engineering (MSOE) and Johnson Controls entered into a partnership that saw new equipment installed at the university. A fully functional HVAC systems lab was developed to enable students of the engineering school and students of Johnson Controls to learn in a real world environment. Theory presented in the classroom is reinforced by the hands-on experiences gained in the operational HVAC lab.

The Community College of Denver (Auraria) entered into a similar partnership with Johnson Controls in late 1995. With a state-of-the-art Facility Management and Control System and an Advanced Controls

Lab, this facility accommodates the Johnson Controls Institute as well as CCD's Environmental and Refrigeration Technologies Department. "Everyone emerges a winner. Johnson Controls' students will enjoy the amenities of Auraria's great urban campus and receive college credit for their training. CCD students in Environmental and Refrigeration Technologies will be prepared for jobs with excellent earning potential in a growing and vital industry," said CCD President Byron McClenney.

There are three main benefits to a private/academic alliance. College students gain "real world" experience in courses on control theory and energy management, which makes them better job candidates. Private industry, or business, benefits because of the higher skilled graduates from which to choose from colleges such as MSOE and Community College of Denver. Finally, the academic organization receives up-to-date equipment for their classes and private industry receives additional space in which to train their people.

THE PATH THAT IS RIGHT FOR YOU

Your organization may benefit from using one method or a combination of the three types of training discussed. In order to find the best training provider to implement your training strategy, evaluate each training provider's offerings. Classroom presentations should be geared toward application on the job. A quality training provider will provide hands-on application in addition to theory. Having the opportunity to take what has just been learned and apply it to actual equipment in an atmosphere where mistakes will not damage expensive mechanical equipment solidifies the learning and ensures that you will be able to perform these new tasks when you return to your workplace. Fully functional labs encourage students to experiment with different control and maintenance strategies to understand the effects on the system without the risk of damaging equipment in their buildings.

In working with others while performing tasks in a safe environment, you can learn new ideas and experiment with them without the fear of damaging your expensive building controls equipment. The training program should also provide an opportunity for the participants to discuss course topics with experts and other professionals to broaden their understanding. Other questions to ask your training vendor include:

- Is the training provided generic and applicable to the entire building environments industry or is it product specific to one equipment manufacturer?
- Can the vendor provide local, on-site training, tailored to your specific needs? This type of program can reduce the class time required to get at the material most critical to your operations.
- Can you tour the vendor's training facility? You might also speak with a trainer to make sure you're enrolling in the proper class to meet your needs.
- Are group or multiple student rates available?
- Does the vendor offer a satisfaction guarantee?
- Are Continuing Education Units awarded for participation that could be used toward keeping your professional designation?

Some training providers also offer consulting services that will help you identify performance needs and help find solutions right for your team (e.g. team building exercises, Windows training, etc.). One method of determining training needs is to survey and interview your work force and identify any performance gaps that can be addressed by training programs. Consulting services could include help with developing your training strategy that complements your maintenance strategy all the way through to implementing customized training.

Mechanical equipment service providers with training capabilities may be able to incorporate your training plan as part of a service agreement to allow you to start your development plans immediately. Likewise, building environmental controls firms may be able to include your needed training programs in a construction or retrofit project.

Whether your needs are quality hands-on instruction, tailored on-site training, individual learning materials or customized consulting services, it is important you develop a relationship with a supplier who will keep your interests in mind while they deliver the learning services you seek. Whether that supplier is a private organization specializing in providing learning opportunities, a technical college or trade school, or an alliance of organizations formed to maximize the use of scarce training

resources, the important thing to remember is that continuous learning is a must in today's radically changing world.

ABOUT THE AUTHOR

Chuck Miles has been with Johnson Controls since 1977, where he has spent 20 years developing the Johnson Controls Institute. He shares his training expertise at many seminars, including the Association of School Business Officials and Wisconsin First in Quality. He is an active member of the American Society of Quality Control and the International Society of Performance and Instruction.

The Role of Technical Associates in Professional Development

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PURPOSE

The Association of Energy Engineers celebrates its 20th Anniversary and reflects on its accomplishments in developing the energy engineering and management profession. We have made great strides and see great new growth opportunities ahead. This article is part of a series of papers describing associations and professional development. We hope that by reviewing the accomplishments of AEE it will give insight