

## *A Partnership Between EnergyAustralia and Cubic Consulting to Develop Online Training.*

### *Foreword*

This paper reviews aspects of a partnership between EnergyAustralia and Cubic Consulting. EnergyAustralia is Australia's largest electricity distribution network operator and one of Australia's largest apprentice trainers. It is an RTO in its own right. Its training operation provides for apprenticeship training, ongoing maintenance of competencies of employed staff, and training third parties such as contractors who work on their sites. Cubic Consulting provides a number of training services, including the development of online training programs.

EnergyAustralia has used computer based training in various areas of its operation including compliance and technical training. In the area of technical training, it has mainly focused on safety training and assessment. Our two organisations were successful in applying for a \$75,000 grant from the Commonwealth Government's Flexible Learning Framework to develop online training in the technical area of polarity testing.

The project involved the transition from traditional training methods, with online training being blended into a new training regime.

In the partnership between EnergyAustralia (the training organisation) and Cubic Consulting (the online developer), EnergyAustralia provided technical material and subject matter experts in the form of senior technical instructors. Cubic Consulting provided the instructional design and development to create an online program that provides:

- training in the underpinning knowledge,
- skill development through drill-and-practice and
- assessment of skills in a simulated environment.

### *The Training Need*

There are over 1,000 powerlineworkers in New South Wales and many more in other states. They are responsible for providing safe and effective power to electricity consumers. It is essential that they are fully competent, both for the efficient operation of electricity distribution systems, and for the safety of consumers. Mistakes in connecting power to end-users can cause damage to their equipment and property, and can cause serious injury or death to occupants.

Lineworkers need 'hands on' training, including drill-and-practice, to develop their skills. Although problems in distribution systems are very infrequent, there is a wide variety of different situations that can confront lineworkers. Training and testing on live systems to simulate the different conditions is impractical, so current training and testing is mainly instructor led and paper-based. Some hard wired system simulations have been developed to assist training, but they are expensive and limited in their application.

There is an annual requirement by most electricity distributors to re-train and re-test powerlineworkers, especially in the vital area of polarity testing (testing to ensure that a consumer's connection to the distribution system is correct and safe). Current methods are time-consuming for trainers, and lack realism for trainees. The location of lineworkers in rural areas adds to this problem with excessive travel costs and time off work.

A current and forecast shortage of skilled powerlineworker trainers is an additional issue facing the industry.

## *The Solution*

Online training provides an ideal solution to the need for practical drill-and-practice and accurately simulated test conditions. On-screen representations of power lines and switchboards enable trainees to undertake complex tests on-screen. They can then analyse the tests results they achieve to assess the condition of the circuits they are dealing with. The online system can provide trainees with a very wide range of different circuit conditions to test. They can practise on-screen to develop their skills, and also undertake summative assessments on-screen.

Online training also provides the theoretical underpinning for the tests lineworkers perform. The program clearly explains the way in which circuits operate, and the consequence of any faults that could occur.

Online systems also have the advantage of providing best-practice training on demand at any location where lineworkers are stationed. They enable professional trainers to concentrate their activities on topics that need face-to-face delivery, using online programs to develop theoretical and analytic skills.

The program can be viewed on [www.eiotc.com.au](http://www.eiotc.com.au). You are welcome to review it at any time.

## *The Partnership*

There are many ways in which trainers and developers can form partnerships to develop training programs. EnergyAustralia and Cubic Consulting built on an existing relationship to undertake the polarity testing program together. The partnership also includes Integral Energy and Country Energy who have both been active in contributing briefing and review. It has also been supported by EE-Oz, the Industry Skills Council.

The main reason for developing a partnership between a training organisation and a developer is to bring complementary skills and experience together to implement new training delivery methods. This complementarity is the key to a successful partnership.

### *What the Training Organisation Contributes:*

In this case the training organisation is also the employer as Energy Australia is an enterprise RTO. EnergyAustralia's interests are in achieving high standards of on-the-job performance from trainees, and more effective methods of training in the face of a shortage of trainers and increased demands for training.

Key contributions of the training organisation are:

- 'Ownership' of the trainees, who are mainly apprenticed or practicing powerlineworkers.
- Familiarity with trainees and how they learn. This experience often develops skills in individual trainers, each developing a unique style for motivating trainees and getting points across.
- All the technology and procedures addressed in the program.
- The language and culture of the industry.
- Piloting the online training approaches and prototypes, and piloting them with trainers and trainees.
- A distribution system for deploying the online training throughout the organisation.
- Implementing the training, integrating it into the existing training programs and ensuring that trainees are achieving the learning outcomes required of the program.
- The ability to continuously review and improve the effectiveness of the program.
- An existing relationship with others in the industry.

### *What the Online Developer Contributes:*

The online developer, in this case Cubic Consulting, is experienced in managing online projects, but has little initial familiarity with the required training outcomes and subject matter. The main contributions of the online developer are:

- Project management, based on the developer's experience in the process of producing online programs. The project plan and the management of the project are often best assumed by the developers.
- Instructional design, based on well established principles of instructional design for online programs. However, trainers have a major contribution in editing and fine tuning the design.
- Development of scripts and storyboards. Initially this is best handled by the developer, but it is a skill that can be progressively transferred to the trainer.
- Developing Flash interactions - this is a specialised activity that is generally handled by the developer or a specialised contractor.
- Developing assessment or testing techniques.

### *General Approach*

The polarity testing training programs involve a mix of theory and practice. Powerlineworkers are very 'hands on', most of their work involving field operations. The theory is needed to guide their actions and decisions.

This calls for online training programs that are blended into the existing training regime. The online program was planned to address cognitive aspects of training, as well as providing practical drill-and-practice in some areas of diagnosis and procedure. The trainers' ongoing role is to confirm the competencies acquired from online training, as well as providing the 'bridge' between theory and practice.

### *Challenges*

Bringing two partners together for the first time to operate a project in which both teams are highly involved presents a number of challenges.

### *Getting to know each other*

The first challenge is for each group to understand the other. Each group has its own culture and own experience in operating projects that have been brought together to operate a new project. The online developers must understand the subject matter. What is second nature to trainers can be completely foreign to the developers. Developers have to understand the theory if they are going to get the instructional design right.

Equally, trainers need to understand what can and can't be done with e-Learning. The basics of online presentation can be understood pretty quickly. However, some features that can be built into the programs can be complex, especially Flash interactions. There is often a technical or cost gap between a 'good idea' and a practical online solution. Close teamwork is needed between the trainers and the developers to address these issues.

Respect by members of each group for members of the other is essential. However, this should not prevent each challenging the other. Trainers can suggest improvements to features of online presentation. Developers can query technical aspects of training and how they should be presented to trainees. It is important for both parties to feel confident in challenging then the other, rather than simply accepting proposals for different elements of the program at face value.

## *Industry Factors*

Although EnergyAustralia has taken the initiative in developing the polarity testing program, the program itself is aimed at the broader electricity industry.

The electricity industry comprises a wide range of operators; generators, transmission operators, local network operators (distributors), contractors, rail operators, consultants and training organisations. These operate in all states and territories.

Although the basic theory of generating and distributing electricity is common to all parts of the industry, different states have developed their own laws, regulations and codes for the operation of different aspects of electricity supply. Network operators develop their own codes of practice and safety procedures. Even within one organisation, there can be different ways of describing systems.

There are moves toward developing national standards that will make training qualifications 'portable' between states and operators. However, this movement will take time to work itself through the industry.

Online training can accommodate some of these differences. However, in many cases it is important to develop a standard approach. A good example is in getting the terminology right. If a conductor has no electrical potential (voltage) is it 'de-energised', 'dead', 'in-active' or open circuit? Each term has its own connotations. 'De-energised' suggests that it normally is energised. But an earth system generally (hopefully) is not. 'Open circuit' can mean that the switch is off, but it is generally taken to indicate a fault in the circuit. So if you test a conductor, and find it has no voltage, how do you describe it? It is easy to get the general concept across in a classroom using a number of different descriptions. Online programs cannot easily 'talk around' the point.

Online training demands as much uniformity as possible and this can sometime challenge existing training which is less constrained. With online programs, the challenge is to get teaching points across to all trainees. Online programs have the advantage of presenting animations and interactions that illustrate 'tricky' or difficult concepts that are often not available in the classroom.

## *Instructional design*

The introduction of online elements of training calls for many changes, both for trainers and trainees. Traditional trainers do a lot of things almost instinctively. They watch trainees, and can react to questions, often finding alternative ways to present a concept until they know that the trainee has 'caught on'. They can also judge the motivation of different trainees.

The design of the program started with a comprehensive Design Document that was circulated throughout the industry by EE-Oz to enable other industry members to contribute to the overall project.

Both parties identified detailed training outcomes for the program and the specific teaching points that had to be addressed to achieve them. In a blended environment, this requires decisions about which points were to be included in the online program and which were to be retained for face-to-face training.

What works in the classroom doesn't necessarily work online. The instructional designed address the sequence in which the topics and drill sessions are presented, the specific words and language to be used in the program, techniques for introducing formative assessment and the detailed design of the test simulations.

## *Accuracy and Completion*

Online programs must be complete and accurate. Descriptions must be clear and unambiguous, as the computer is not able to answer trainees' questions within the training program (trainees can access trainers by linked emails, but the need for this should be avoided).

Accuracy was achieved by comprehensive briefing and by trainers conducting detailed reviews of prototypes. In many cases, the discipline of simulating testing techniques online and testing the online prototypes caused trainers to review their terminology and to expand on procedures being addressed. Testing techniques used by line workers are relatively straight forward if the system is operating correctly. Simulation of the wide variety of possible faults in systems uncovered additional elements that had to be built into the online program.

The completeness of the program is tested against the required learning outcomes. Completeness was defined by both parties at the early design stage. Some of the main issues that had to be addressed in the development of the program were having to take into account specific requirements of relatively unusual installations, such as are encountered in rural distribution or in older systems. The program also had to be expanded to take account of newer distribution practices, such as the move to underground distribution rather than the more traditional power lines that bring electricity to consumers, calling for additional testing simulations.

### *Developing new training regimes*

At the time of writing, the incorporation of the polarity testing program into the organisation's operations is still ahead of us. In the case of powerlineworkers, who have to be re-assessed annually, trainees will be required to go through the training and assessment online before presenting for practical assessment by a trainer. The trainer will have evidence of the assessment results. Trainees will have to achieve a 100% pass mark in the online assessment before being finally tested by a trainer. The same will apply to apprentices approaching the topic for the first time.

This will require supervisors and trainers to:

- Inform trainees of the need to undertake specific online training programs
- Access the database in the online training system to monitor the progress of trainees.

### *The Benefits of a Partnership*

If the 'chemistry' between the training organisation and the online developer works well, it is highly efficient to maintain a partnership. There is a significant investment in each group getting to know the other. The initial project establishes methods of project management between the two organisations that take account of the different culture and practices of each. There are considerable economies in both parties learning what training approaches do and don't work. Further, there are economies of scale in production of online programs.

However, the partnership should not become introverted. It is important to challenge the way things are done, and to be open to new online training roles and techniques. This is assisted if the developer is engaged in a wide range of other projects that introduce new approaches and techniques to online training.

### *What made the Learning Partnership Successful*

The most important factor that contributed to the success of this partnership was the bringing together of two professional organisations who had a shared commitment to the project. There was a shared recognition of the need for careful planning to minimise any 'surprises' along the way. Key issues contributing to the success of the project are:

- Selection of the topic. Polarity testing was ideal for online training, as the computer simulations are uniquely able to present different system situations for trainees to practice on.
- Planning of the project so that both groups, as well as our government sponsors, knew exactly what was to be produced, and the key milestones in the project.
- Instructional design that laid down to foundation of underpinning knowledge, and then closely simulating real life situations.

- Screen design which created a balance between 'iconic' and real life. Illustrations of power lines, points of attachment and switchboards had to be simplified or 'iconic' to eliminate a lot of irrelevant background detail, but sufficiently representative to be realistic for trainees.
- Constant communication between trainers and developers to swap ideas and monitor progress.
- Continuous review of the program by trainers, to identify any problems and to implement improvements to presentation of the program evolved. Each simulation started with a detailed story board illustrated with jpeg graphics, before the Flash animation was undertaken.

The project will be successful if it is widely adopted by industry beyond EnergyAustralia. It is receiving widespread support by the industry which will lead to piloting and adoption by operators around Australia. More important, it will be successful if it acts as a catalyst for the expansion of the use of online training to meet the training challenges facing the industry over the next five years.

### *Learner Benefits from the Partnership*

At the time of writing, the learner benefits from this program are still to be fully realised. The key benefit to learners is the development of a program based on the extensive experience of industry trainers combined with the development skills of a firm with many years experience in computer based and online training program development.

The benefits that program is planned to deliver include:

- Engagement of trainees in a stimulating new learning medium.
- Reduced training time required to achieve mastery of the topic.
- Ease of using the program.
- Perceived relevance of the program to their job.
- Convenience of being able to undertake initial and refresher training any time without traveling, and without waiting for professional trainer to become available. This is particularly important for people working in regional areas of operation.
- Consistency in training delivery.
- More comprehensive coverage of real-life scenarios than previously possible.
- Confidence in taking their skills to the workplace.

### *The Authors*

#### *Tom Emeleus BE(Elec) BA (Int. Studies) M Eng.Mgmt*

Tom Emeleus is Training Manager at Energy Australia. Tom has degrees in electrical engineering and International Studies, with a focus on South East Asia and a Masters degree in management. Tom has worked in the electrical supply industry for 13 years in a range of roles, including project management of electricity and telecommunications infrastructure projects, internal audit, asset management in Indonesia and training. In his current role Tom is responsible for the largest apprenticeship program in NSW. He has also worked on IT development projects and is keen to foster the growth of e-Learning in his organisation and industry.

#### *Gidley McCullagh BE(Chem) BEc*

Gidley McCullagh has extensive experience in the field of computer based and online training. He has been involved in the development of a wide range of programs for trainee groups ranging from truck drivers and furniture removers through frontline managers and professional operators in sales, finance, health and other industries.

Coming from a background of technical and industrial marketing Gidley has a focus on how online systems can be blended into other training and support modes to achieve direct and measurable outcomes for clients. We have also worked in partnership with a variety of associations and corporate clients to bring a combined focus of our online developers and client subject matter experts in a team approach to providing wide ranging trainee groups with job-related skills.

