



Australian Government

Department of Education,
Science and Training

National Skills Shortages Strategy

National Electrical and Communications Association and
Department of Education, Science and Training



SKILLS SHORTAGE PROJECT

Summary, May 2006

Skill Shortages – The Industry’s Response

The skills problems confronting the industry in 2005 are much different than five years ago when we last conducted such research. At that time our major problem was attraction. We believe now that the programs we have in place successfully addressed that problem. Although the shortages continue it is for different reasons. The shortages arise because of:

- An ever diminishing labour pool affecting all industry
- Rapid changes in the technology
- The inability of the skill delivery infrastructure to respond in a timely manner.

Our research has found that the industry does adapt well to the growing demands from its customers as is demonstrated by the integration of the electrical and communications skill sets into a single occupation.

The industry’s response to the change in technology was to use the traditional electrical tradesperson as the core of its skills base, and up-skill in the new technologies predominantly by vendor training and short courses.

Regrettably training in the emerging technologies has been reactive rather than future looking, with vendor training filling the gaps in providing the workforce with the skills required for new products and installation systems as they are brought to market.

These findings take the issues beyond the original discussion about the content of the apprenticeship training and the licence requirements. The response is to develop a program working more closely with other links in the supply chain. This is discussed in Sub Project C under the Industry Skills Marketing Project, otherwise known as Project Sector 3 (refer report separately).

Project Sector 3 is a very exciting development, expanding our vision, scope and opportunity for resourcing. It also means that we have a "whole of industry" commitment to addressing the problem. As well, and possibly more importantly, we start to extend our mind to the true scope of industry and the career pathways available.

The National Centre for Vocational Education Research (NCVER) Report researched for this project – *Training and Skills in the Electrical and Communications Industry January 2006*, creates a valuable analysis of the industry that has not previously been available for those charged with the responsibility for developing policy and planning for the industry. At a macro level the report is invaluable. Equally, for the industry practitioners, those developing business plans, the report describes the elements of the market and the industry dynamic.

The full report is available on request from the NECA National Office.



NEVILLE PALMER

NECA President and Chair, Project Working Group

1. Skill Shortages and the New and Emerging Technologies

1.1 Recommendations

1. An independent labour market forecasting and planning program be created.
2. Training Package content and Occupational Licences be linked to labour market and technology forecasts.
3. The industry work with the Public Provider and Vendors to integrate the new technology into training.
4. The Training Package be redrafted to provide:
 - entry and exit points on the path to Certificate III Systems Electrician qualification
 - the ability to enrol for a single unit of competence and "mix and match" across competencies, qualifications and other packages
 - the facility to accumulate competencies over time to achieve a qualification.

This could provide a qualification that achieves the licence and skills for the new and emerging technologies.

5. Continuing Professional Development be introduced as a requirement for renewal of a licence with a main requirement being skills for the new and emerging technologies.
6. The electrical licence requirements be reviewed at least every three years against the technology and relevant requirements and the training package qualification be revised accordingly.

1.2 Comment

An issue for the electrotechnology industry is that the requirements defined for an electrical licence do not align with the work being undertaken by most electricians. For instance, to obtain an electrical licence, the tradesman must be able to demonstrate knowledge of electric motors, whereas most electricians would never encounter an electric motor and, if they do, it would be for replacement or disconnection to send to a specialist for repair. This reference to electric motors is not a safety issue but an indicator that the licensed applicant has good, broad trade skills. The issue for the industry is that its indicators of 'broad trade skills' are no longer representative of the skills that tradesmen require and the employers insist the tradesmen have.

Other issues:

- Is the licensing adaptable to the New and Emerging Technologies?
- Does a qualified/registered tradesperson have the skills required to maintain contact with current technologies?
- Are the requirements for the licensing (66 capabilities) reviewed often enough? Are they out of date?
- Is there a possibility to consider specialist licences?

1.3 Skill Shortages 2005

There is employer investment in training, the attitude toward careers in the trade is positive and there are quality applicants for apprenticeships and careers in the industry. So why are there skill shortages?

In 2005, the shortages are attributable to the following causes:

- The pool of labour is insufficient to meet the demand. With virtually full employment, and the expectation that growth in the labour pool will be less than the growth in workplace demand, the problem will continue and the competition between industries for the available labour will increase. Hence the need for industries, training delivery and regulatory arrangements to be flexible and able to adapt immediately, within certain limits, to the demands of the labour market at the time.
- With the technology changing, the specification for occupations also is changing. While there are constants etc that are essential components of skill programs and regulation, equally there is the need to respond to the technology and the demands in industry as they evolve.

The industry still relies on the traditional model for entry level training but is going outside that model for up-to-date skills and knowledge.

The following points illustrate how the industry currently responds to the need for skills development due to the impact of new and emerging technologies:

- Demand for employees in electrotechnology continues to be met through apprenticeships, which remain the predominant entry point into the industry, and through some electrical tradespersons moving into more specialist areas.
- The industry still relies on the licensed electrical tradesman as the primary source of skilled labour.
- Current training in the industry appears to follow three different training routes:
 - there are new entrant apprentices undertaking full qualification predominantly at Certificate III level
 - the second training route is undertaken by some new entrants, but also by existing workers training at higher levels such as Certificate IV and beyond in telecommunications. This group tends to be more focused on higher levels of technical expertise and understanding how systems and installations work, rather than on the installation process.
 - the third training route is where training is in short courses and modules rather than in full qualifications, enabling existing workers to up-skill in line with technology change. As the training is mostly short courses it does not usually lead to a full qualification but, rather, to individual certificates or certificates of attendance or competency. This training is provided by vendors and other private industry providers of training.
- Vendor training is seen as being responsive and is about providing specialised product-related knowledge that is up-to-date and often compulsory for warranty conditions.

The involvement of non-public providers and in particular vendors is a new dynamic that has become an essential component of the skill delivery system. The vendors comment that the training they provide must in large part anticipate demand and skill the workforce in anticipation. The installer is not in a position to anticipate either the demand or the take-up of the technology and so must rely on the vendors for this market intelligence. Importantly, this training is done outside the formal training system and the industry training advisory network, and outside the regulators.

The Electrotechnology Training Package has as its main qualification the Certificate III Systems Electrician. This qualification accounts for 80 percent of the population of those accessing the package. The content of this qualification is primarily the requirements of the electrical licence. Accordingly, to change the competencies in the qualification requires revision to the licence and vice versa, a route that is too complicated to allow a timely response to change. Hence, the training in new and emerging technologies is through other qualifications or in less formal but targeted vendor training.

The curriculum content of the Certificate III Systems Electrician is comprised of the technology and the requirements for the electrical licence. Early in 2005 the ISC wrote advising of concerns that the technical content of the qualification was out-of-date. At the same time, the electrical regulators had been approached by NECA to review the technical content for the electrical licence, which hasn't been reviewed since 2000. On both these matters, discussion about the need for review continues. In the meantime, no review of either is taking place ie the training package and the licence conditions don't change even though the technology continues to evolve. As each day passes the training package and the licence requirements become further removed from the requirements of the industry.

Is this the beginning of the era whereby the skills model is in three parts?

- A. Manufacturers simplify the technology and develop product to balance the dependence on available skilled labour
- B. Formal entry training is used to achieve the Occupational Licence
- C. Non-traditional training and non-training package training through vendors is used to keep tradesmen up-to-date in the new and emerging technologies.

2. Licensing Requirements

2.1 Recommendations

1. The system for managing Electrical Licensing be reviewed.
2. The National Committee of Electrical Regulators (ERAC) be formalised and answerable to a Ministerial Council.
3. The harmonisation of licensing regulations be made a priority.
4. The regulation for electrical licensing be reviewed every three years.

5. Electrical workers be required to establish that their skills are up-to-date by undertaking a program of Continuing Professional Development and submitting evidence at the time of license renewal.
6. Common core training could apply across a number of occupations. It could help curb the high attrition experienced in the industry by facilitating their move to other occupations. As well, at a later date the trainee can then resume training and achieve the electrical licence if so desired.
7. The link between the electrical licence and the training package be evaluated so that it cannot be the reason there is no change in either.

Communications cabler registration requirements are minimal and common across Australia. The regulation does not seek to define the characteristics of the worker, but merely the competencies required, ie the outcomes. This is an important distinction as electrical licensing regulation covers elements beyond the safety aspects of the electrician's work, to the extent of requiring the applicant be "a well-rounded tradesman." Electrical licensing regulation is complex, detailed and the subject of legislation in each State.

Perusal of the Report's Appendix G (Synopsis of State/Territory Licensing – Electrical) should inspire a question about the reasons for the lack of commonality. Given the technology and its application is common across the country, why is the regulation so diverse? Put simply, it reflects the Acts of eight jurisdictions and, until the Council of Australian Governments (COAG) agree otherwise, the jurisdictions will prevail.

Despite the State and Territory differences, when necessary, the regulators work in harmony and there are few instances where an electrical worker or an electrical contractor cannot cross borders without having the qualifications recognised from one state to another.

One exception is the Queensland electrical contractor legislation which requires different consumer protection insurance. This is hardly a skills shortage issue and so is not explored further in this report, but needless to say, the industry questions this regional self-indulgence.

2.2 To Keep Occupational Licensing Current

The situation is, the achievement of change is, at best, time-consuming, with many intentional barriers that ensure occupational licensing arrangements are not responsive.

- To achieve agreement across the eight jurisdictions is time-consuming, and proposals for change must be fairly bland given the diverse economic and political imperatives.
- Different ministerial portfolios manage the regulators. In some states it is in the Energy portfolio and in others Fair Trading.
- Mutual recognition requirements constrain any state from independently initiating material change.

These statutory environments have created a dynamic and rules, and industry must comply. A recent example of the product of this system is Philippine trained line workers

contracted to work in Queensland. They do not meet the regulator's requirements to work in Queensland but they do satisfy the Victorian regulators.

- Their qualifications were assessed and recognised under Victorian regulation.
- They relocated to Queensland and because of mutual recognition agreements between the Victorian and Queensland Governments they are able to work as lineworkers in Queensland.

The system works but not with ideal efficiency and cohesion.

2.3 Occupational Licensing and the Training Package

There are aspects of the licensing criteria that, because of changes in the technology and its application, lack the relevance in 2005 that they did in 2000, when the requirements were last reviewed. Despite the Electrical Regulatory Advisory Council's (ERAC) concurrence, and the Industry Skills Council's concern that the content of the electricians training is out of touch, the Industry Skills Council has not responded to a request from ERAC for a proposal to review the technical content that forms part of that criteria, nor has ERAC pursued its initial enquiry with the Industry Skills Council.

It is oft stated that the reason the electrical licence is not reviewed is because any change requires a consequential change in the training package which is too hard to achieve. Similarly, any proposal to review the training package is viewed with the same conservatism because recommendations for change would mean a change to the requirements for the electricians' licence which is too hard to achieve.

The result is a cumbersome package and neither the package nor the licence is subject to enough critical review in a timely manner and change is avoided as much as possible.

The above also overlooks the accusation, by some, that the current licence and training package arrangements are the tools of those seeking to resist change.

ERAC is at best loosely formed and despite the good intentions of most that participate, appears to have little influence with state legislators.

ERAC's lack of resources means that it is not able to participate in the affairs of the industry to the extent that the regulators should. Given the influence they exert over skill requirements it is an indictment that the electrical regulators, either individually or collectively did not make a submission to the COAG Working Group formed to "address the barriers across the Vocational Educational and Training System to achieve a national approach to apprenticeship and training."

The working group was to look at full mutual recognition of skills qualifications, an appropriate system for recognition of overseas qualifications, shortening the duration of apprenticeships, allowing intermediate or specialised qualifications – all which affect occupational licensing. More particularly, the working group was to focus on hairdressing and electrical trade qualifications as its pilot.

Clearly, electrical licensing requirements would be relevant to the COAG Working Group. Equally, the COAG Working Group may well find that electrical licensing is an unnecessary barrier to change and that in itself needs to be reviewed. Either way, the electrical regulators had an obligation to participate but they didn't.

2.4 Option to the Traditional Model

During its deliberations, the project Steering Committee evaluated a reconfiguration (Figure 1) of the training package such that the competencies up to Certificate II in the Systems Electrician qualification formed a common core suitable to a range of occupations from which specialist streams could then be taken for the appropriate Certificate III qualification.

The model was considered to merit evaluation more broadly across the training sector and could be the platform for future reform

3. Ageing Workforce and Related Training Issues

3.1 Recommendations

Ageing Workforce – New Entrants

1. Develop a program to encourage entry to occupations in the industry through non-apprentice pathways.
2. Identify the occupations where entry is allowed through a non-apprentice pathway, market the opportunity, ensure training is available and engage regulators to address licensing issues.
3. Promote the recognition of current competencies and the recognition of prior learning.
4. Work with the industry skill centres and vendors to tailor training to meet the needs of the target audience.
5. Qualifications are issued via a competency-based, not a time served, training model.
6. The training package be restructured so that the units of competence are stand alone and people in a non-

apprenticeship pathway can be encouraged to work toward a qualification in the training package.

7. Develop strategic alliances with other countries in the region that remove the barriers to the free flow of skilled labour.

Ageing Workforce – Existing Workers

8. Develop succession planning strategies that take in management succession, lateral movement across occupations in the industry and technical up-skilling.
9. Review occupational licences only on the evidence that the skills are current and the licence holder has participated in an approved Continuing Professional Development program.
10. Promote the opportunities created by accessing Recognition of Current Competencies (RCC) and Recognition of Prior Learning (RPL) to the industry.
11. Market the Industry Recognised Qualification Framework as the skills recognition currency for the industry.

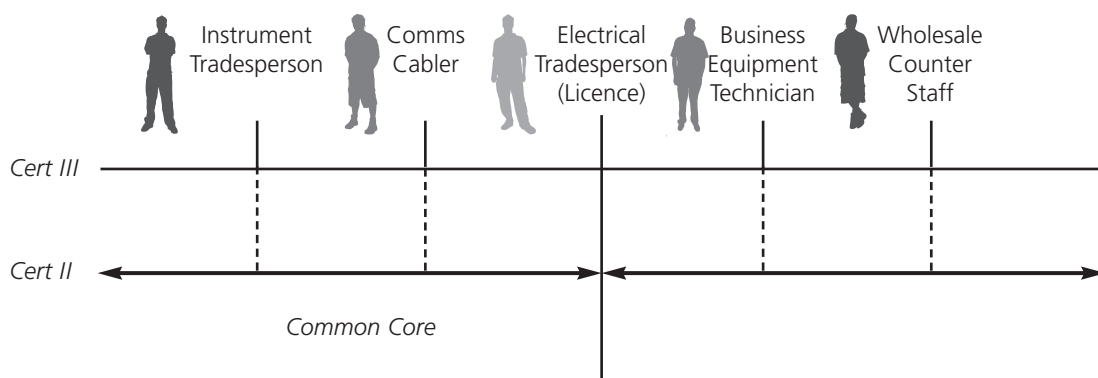
For the electrotechnology sector, the problem of the ageing workforce invites consideration along two separate streams. Firstly, new entrants where the pool of available labour for occupations in the industry includes people beginning their second or third career and beyond. Secondly, the existing workforce of those within the industry that are not up-to-date with the current technology.

3.2 Tradition

The NCVER research finds that apprenticeships continue to be the entry vehicle into the industry. There continues to be little entry level training for the electrical segment of the industry outside the traditional apprenticeships. This cannot be challenged and the industry infrastructure has inherent disincentives for other forms of entry.

The apprenticeship system itself is one that is clearly designed for people beginning their first career. Apprentice wages are structured as a training wage for young people with no financial commitments. Even the training package is structured so that the entry and exit points provide only notional opportunities to achieve a qualification other than

Figure 1 Training Model Option



electrical tradesman which is the currency necessary to achieve an electrical licence.

One issue that has been debated over recent times is the duration of apprenticeships and whether shorter apprenticeships may be a solution to the skills shortage problem. NECA rejects the concept noting the problem is insufficient numbers with the required skills to do the work available, not that they are over-qualified. The union has stated its belief that an employer objective is to de-skill the workforce. This is not supported by the evidence and there is certainly no business case either. However, there is still a need to increase the volume of labour, albeit skilled labour. Where does it come from, and how we skill the worker in a timely manner is the dilemma.

3.3 Technology

In an ideal world, there would be enough workers trained and skilled with a broad base in the technology and be licensed with the regulators in electrical and communications sectors to meet the labour requirements.

This is not an ideal world and skill shortages are a real problem. As previously stated, NECA does not consider reduced training periods as a productive strategy, however neither should nominal durations as qualification requirements be barriers to people gaining qualifications and doing work for which they have the skills.

Having said that, our objective is to ensure the skills these people acquire to work with these technologies are measured against competencies in the training package and can over time be built on to achieve the broad based skills and therefore higher level qualifications across the broader range of the technology.

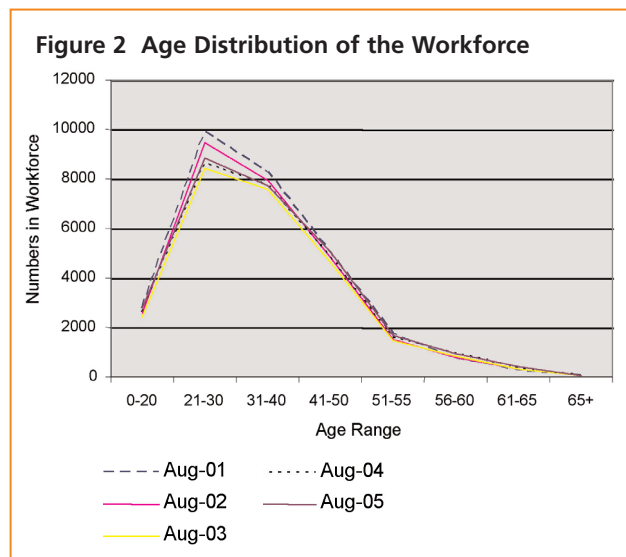
There are a range of options for action that would achieve this objective. These options leave the traditional apprenticeship, training package and occupational licensing intact, although hopefully both the Industry Skills Council and the Electrical Licensing Authorities will be prepared to look at some alterations to their present absolute and inflexible requirements. The actions that we must initiate are:

- Identify occupations within the industry that can be accessed by people entering the industry through the non-apprenticeship model.
- Define the skills gap and make sure training is available so that people can obtain the skills to work in these occupations.
- Work with the regulators to ensure the licence is not an unnecessary barrier to mature people working in a responsible manner with aspects of the technology. The Victorian regulations could provide the model. Those regulations allow an employer or a licensed electrician to approve the worker to undertake certain work provided that worker has the skills and is aware of the safety implications.
- The training package needs to be drafted so that the competencies are discrete ie stand alone and can be built on to ultimately achieve the qualification.

- Access skill centres and work with vendors to tailor training to the needs of the audience ie those seeking occupations in the industry.
- Develop strategic alliances with other countries in the region and work to remove the barriers to the free flow of competent labour. The Federation of Asian and Pacific Electrical Contractors Association Conference (FAPECA) in Melbourne in 2006 could be the opportunity to begin the formal program. While some countries do not have suitable skills development programs, there are others such as Malaysia, Singapore and the Philippines where skill programs are in place.

3.4 Retention & Upskilling

The industry experiences a high attrition rate both from apprenticeships and workers beyond age 35 (Figure 2).



Previous reports have found that while the attrition rate is high, many move to management within the industry or other related occupations such as maintenance worker. However, while there is still the problem of too much experience leaving work "on the tools," an even bigger problem is keeping existing workers up-to-date in the technology.

We have already spoken about the increasingly important role of vendor training which is outside the formal training system and the qualification framework. We have mentioned the skilled electrical line-workers brought in from the Philippines that have qualifications recognised in Victoria to allow them to work in Queensland. We have a diminishing labour pool and the anticipation of an increasing demand for labour. The demand will exceed ability of the formal system to supply.

While we plug the gaps to retain workers, to arrest the leakage, we still have the problem that too many of those we retain have not kept skills up-to-date. The technology is passing by too many of them.

It is only over the past decade that the licence has been subject to renewal, but even now the only renewal criterion is payment of a fee. The concept of Continuing

Professional Development has been discussed and is on the cusp of introduction in at least one jurisdiction.

The need for existing workers to keep up-to-date with the technology has accelerated with the pace of change in the technology and its application. The commoditisation of the voice and data communication technology has brought this home to many people as the work available to the traditional electrician more and more includes aspects of the voice and data communications technology.

In 2003 NECA, with the electrical supplier Hagemeyer, introduced a program to up-skill workers. The concept was based on the belief that most workers in the industry had developed high level skills through on-the-job experience and non-accredited training through vendors. If we could assess these current competencies and provide an accreditation, we anticipated that many would automatically be awarded higher level qualifications and the remainder would be pleasantly surprised at the extent of their now recognised competencies and the modest gap to achieving another qualification. For these, we were offering to provide the training at no cost.

The beauty of the concept was:

- The facility to recognise current competencies at no cost to the applicant
- The offer of gap training
- The esteem that would be generated amongst the workforce and then across the industry
- A national metro and regional delivery network through wholesaler outlets.

We believed the overall effect would be extremely positive and create a workforce with a higher value of its own worth. This would create a momentum that would see more people submitting themselves for RCC and RPL, and committing to training programs.

The actual result was exactly the opposite despite the fact that the RPL/RCC was available online and in privacy through 180 outlets across the country. The response was at best modest. We had failed to anticipate the concern about failure and even though there was no consequence, this fear of failing was sufficient disincentive for people not to submit and take up the benefits and opportunities on offer.

This proved to be a valuable lesson in helping us to understand the problem with training in the new and emerging technologies. Unless there was an imperative, the workforce would not submit itself to further training and education. This was a problem for vendors seeking to introduce new products and concepts to the market.

Vendors have the products, but there is no point in generating demand from the consumer if the installers are not trained in the installation and maintenance techniques. Hence, the vendors have developed relatively sophisticated and demanding training for installers that links the training to warranties.

It is the vendor warranties that are essential for the installer and if these are only offered to people who have submitted to the training then there is value to the installer submitting to the training. But not otherwise!

We have yet to overcome the initial problem but nevertheless, the industry has found a way around its problem of up-skilling the workforce. Regrettably, this doesn't use the public provider training system, it doesn't rely on the training package and it doesn't assess against competencies or provide accreditations toward a qualification in the training package. It is also independent of the licensing requirement.

3.5 Industry Recognition

As part of the up-skilling program, we reviewed the range of non-training package accreditations that were available and these seem to dominate all post-trade training. There were many in the industry that had participated in these programs but those awards were not recognised beyond the particular provider and many in the industry had multiple awards obtained from different providers. To this end we set about developing an industry recognised qualifications framework. As illustrated in Figure 3.

Given the lack of take-up of training package qualifications, we believe the industry recognised qualification should be pursued. It is only through such a framework that we can monitor quality and integrity in the assessment and qualifications. The ultimate objective is to have the industry qualification aligned with the training package qualifications or alternatively the Industry Skills Council finally recognise that industry has needs that are not satisfied.

4. Succession

The industry is made up of a high number of relatively small businesses. For example, the NECA membership is 35 percent sole traders and 35 percent employing between 1 and 5 employees. A further 12 percent employ between 6 and 10 employees. It is unrealistic to expect these companies can successfully and efficiently plan succession of their workforce. That is not to say the remaining 17 percent of companies should not be encouraged to introduce succession planning.

While the industry doesn't have plans, it knows most staff will not work on the tools past 35 years of age. Companies do not have plans about how to use them in other capacities, and therefore lose them.



Figure 3 Industry Recognised Qualifications Framework

AQF	ACRS SKILL LEVEL	SKILL LEVEL	UPSKILLING	ENDORSEMENTS	SMART WIRED	VENDOR TRAINING	HIGHER LEVEL
Diploma		8					Instructor Cert IV Workplace Training
	ACRS Skill Level III	7					RCDD LAN Specialist
Cert IV		6					Commercial Design RCDD
		5					SW III – Design (Current Course)
Cert III	ACRS Skill Level II	4	Level 3 Testing II	Fibre		Fibre	
		3	Level 3 Testing I	Coax Cat 5 / 6	SW II – Voice, Data, Security, Lighting, Video	CBus I Central Hills	
Cert II		2	ACA Workplace Ready		SW I – Voice / Data		
		1	BASE				
Licensed Electrician Open Registration							

Steering Committee Membership

ACCI: Steve Balzary

NECA: Peter Glynn

Skills Council: Peter Buck, Director representing Energy Supply sector

Other Relevant Industry Bodies: Robyn Norris, Chair, Electrical Wholesalers’ Association of Australia, Erik Scholz, Director, Australian Electrical and Electronic Manufacturers’ Association

Electrical Sector Employers: Neville Palmer, Gordyn & Palmer (and NECA President), Frank Russo, Boffa & Russo Steve Griffiths, Phasor Electrics

Communications Sector Employers: David Madson, Stowe Australia, Brett Conran, The Somerville Group, Wes McKnight, WM McKnight & Son

Regulatory Bodies: Ken Gardner, Electrical Safety Victoria, Alan Major, Australian Communications and Media Authority

STA Representatives: Neil Miller, Director of Training Initiatives, Department of Training Queensland

Major Training Providers: NSW TAFE Ian Millner, Milcom Communications (private provider)

DEST: Suzie Hewlett

DET – Victoria: Leela Darvall, Manager, Programme Development Unit

Terms of Reference

The Committee is formed to ensure the project outcomes are delivered in accordance with the Contract and budget. Committee membership is representative of the industry and the individuals have been selected because of their authority and depth of relevant knowledge.

Disclaimer

The views expressed here are those of the author and do not necessarily represent the views of the Australian Government Department of Education, Science and Training.

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