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Prepared by: Kate Perkins

Kulu Pty Ltd.

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Meat & Livestock Australia Limited
Locked Bag 991
NORTH SYDNEY NSW 2059

Building industry capacity: the engineering network and tech tour

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Abstract

Over the next 10 years, industry representatives recognise that the red meat industry faces significant challenges, from global economic downturn to labour shortages, from changing legislative requirements to negative perceptions of red meat from health and environmental perspectives. If companies are to thrive whatever the future brings, leaders and managers at all levels will need new knowledge and skills. In light of this, MLA and AMPC are currently reviewing a number of professional development and training initiatives to ensure that they facilitate the development of industry capacity to improve current operations and support future sustainability.

While this project focused on the Engineering Network and Technology Tour, it also considered broader issues in regard to industry skills and knowledge needs and professional development. To this end, a professional development framework was developed in consultation with industry representatives to provide a context for further discussion.

The study found that the impact of the Network and Tour could be increased if priorities were clarified, target groups better defined and a greater focus placed on methodologies that encourage learning through exploration of ideas, peer interaction and deep reflection. However, even if revamped neither is well suited to facilitating the kind of transformational change that industry representatives have identified as imperative. Rather than try to adjust these programs, it may be more effective to introduce new mechanisms to support companies as they learn how to tackle radical (rather than incremental) innovation.

Executive summary

Over the next 10 years, the red meat industry faces significant challenges, from global economic downturn to labour shortages, from changing legislative requirements to negative perceptions of red meat from health and environmental perspectives. If companies are to thrive whatever the future brings, it is becoming increasingly clear that leaders and managers will need new knowledge and skills. In light of this, MLA and AMPC are currently reviewing a number of professional development and training initiatives to ensure that they facilitate the development of industry capacity to improve current operations and support future sustainability.

While this project focused specifically on the Engineering Network and Technology Tour, it was part of a suite conducted by Kate Perkins of Kulu Pty Ltd to inform strategic discussions about the current and future needs of the industry generally, and to identify options for future development. The study aimed to evaluate the impact of the Network and Tour on individual participants, their companies and, where possible, the industry; consider what can be learned from these and other networks in regard to the provision of effective professional development within the industry, and identify alternative approaches that might facilitate the development of the skills and knowledge the industry will need in the next five to ten years.

Key findings
Industry representatives believed that future leaders and managers, including plant engineers, would need a 'Big Picture' perspective, strong networks, the specific knowledge and technical skills to do the job effectively, and confidence in dealing with regulators.

The study found evidence that the role of the plant engineer is already starting to change in response to emerging trends and pressures. Although the majority of engineers are not degree qualified, they are starting to move beyond the traditional focus on maintenance as they consider new technological solutions, particularly in response to changing environmental expectations and regulation. Potential technological innovations are often complex. They require deep investigation, tailoring to the needs of the individual plant, and considerable financial investment. Plant engineers may find themselves as members of teams involved in what, in effect, is transformational change affecting company structures and systems and the nature of people's jobs.

The Engineering Network and Technology Tour have been operating since 2003 and 2004 respectively, catering largely for the professional development needs of plant engineers. Both are well utilised by a small group of companies who regularly send participants. Yet, while each meets these participants' needs to some extent, it is not clear that either program is currently an effective vehicle for developing the types of critical new skills that industry stakeholders have identified.

The Engineering Network is valued by a small group of companies and participants who see it as their only opportunity to break the isolation of their roles, network and keep abreast of new technologies and processes. There is a role for such a forum. However, its current one off 'event' style is not conducive to peer interaction and does not allow time for exploration of, and reflection on the information and ideas presented. At the very least, it should be revamped with fewer topics and more facilitated discussion. Current participants would like to see it extended over two days, with the potential for follow up sessions on 'hot' topics, perhaps involving them in some action on plant between meetings. (Such an event may have the added benefit of attracting more interstate participants). Alternatively, they suggested a national two day conference that could precede a series of state/regional meetings, (along the lines of the MINTRAC facilitated QA and Environment Managers' Networks but with 1 day rather than ½ day meetings). A tailored Tech Tour could be offered as part of the package.

Although originally open to anyone, the current Tech Tour is proving to be a cheap and cheerful way of raising younger staff members' industry knowledge and awareness of different types of plant operation. It is also an effective way of forming friendships and building professional networks. It offers good value for money now, but could have a far more powerful impact if it were officially designated a Young Leaders' Tour, with a selection process that encouraged applicants to think about why they wanted to go, and raised the industry status of those who were chosen. A small group of highly experienced industry members could be invited to participate as mentors. This would also offer the potential to develop formal synergies with other industry programs, such as the national Leadership Program, and the post-graduate professional program.

While the existing Tour might become more targeted, the tour concept could also be utilised to provide practical, hands-on insights into the themes/topics being investigated by existing Networks or new Communities of Practice - for example, an Innovation Tour linked to a relevant Community of Practice, where the sites are selected on the basis of their relevance and demonstration of leading edge practices. Whatever shape the Tour takes in future, it would also benefit from the introduction of facilitated activities designed to encourage reflection on the implications of the experience for the participants' own contexts.

A tightened focus, combined with scaffolding to support learning, would increase the immediate value of participation in the Network and Tour, in terms of developing participant skills and knowledge and building cross-plant links and professional networks. It would also increase the potential for exposure to new ideas that may lead to a participant taking action on plant. However, while both programs could be redesigned to better promote individual learning, they may not be the best means for facilitating company learning. This should not be seen as a criticism. Developing industry capacity for the future cannot focus solely on increasing the skills and knowledge of individuals. Transformational change involves a broad mix of people working together, and suggests the need for a new kind of program that would encourage companies to implement paradigm shifting, technologically-driven innovations. This would involve plant engineers, but not be aimed solely at them.

The Greenhouse Challenge Community of Practice and other meat industry networks offer insights into models that will work. A theme/topic based Community of Practice could facilitate the professional development of its members while also acting as a mechanism to support company innovation. It could involve groups of relevant staff from a small number of committed companies, plus industry representatives and invited experts in the field. The program could be designed to facilitate action learning, with regular meetings to reflect on the results of on-plant trials and data collection and be introduced to relevant new information. Companies could be further supported through links to Plant Initiated Projects and/or Undergraduate projects. Again, there is potential for a Tour (perhaps including overseas sites) as part of this package. While the Community of Practice might initially involve those already at the leading edge, strategies could be developed to draw in other companies over time.

While changes to the Engineering Network and Tour should in themselves assist capacity building within the industry, the review has also identified factors to be taken into account in the design of any professional development activity or program. For example:

- the importance of creating opportunities for sharing of information and ideas amongst peers, as well as listening to input from external 'experts'
- the psychological and practical value of getting away from on-plant pressures to mix with like-minded people and establish face to face connections

- the need to recognise the importance of designing meetings, forums and tours from a learning perspective as well as from a content perspective. This may mean involving a team of facilitators who between them have specific technical knowledge, industry credibility and skills in the design of programs that facilitate learning.

These factors been taken into account in the design of a draft blueprint for professional development in the red meat industry. This framework offers a context for planning how to 'ensure that the meat and livestock industry has access to the skills and knowledge it needs to be profitable and sustainable'. In the short term, it should provide a provocation for further discussion with key stakeholders. In the longer term, a revised version could provide a useful tool for planning, monitoring and evaluating a range of connected strategies for change.

Recommendations

- Finalise the Professional Development Blueprint in consultation with industry stakeholders and identify priorities.
- Repackage the Engineering Network as a two day, workshop-style national conference, followed by themed state/regional meetings designed to facilitate deeper exploration of participant identified 'hot topics'.
- Re-badge and redesign the Tech Tour as a Young Leaders' Tour program, linked to the National Leadership program and build in more structured discussion as a key aspect of the experience.
- Identify new Tour options e.g. an Innovation Tour as an integral part of the new Communities of Practice, or a tailored tour as part of the new look Engineering Network
- Ensure that all professional development programs, networks and forums involve facilitators with technical skills, industry credibility and skills in facilitating learning.
- Gain support from key industry leaders to develop a pilot Community of Practice focused on a key area requiring transformational change.

Contents

1 Introduction

1.1 Background

Over the next 10 years, the red meat industry faces significant challenges, from global economic downturn to labour shortages, from changing legislative requirements to negative perceptions of red meat from health and environmental perspectives. If companies are to thrive whatever the future brings, it is becoming increasingly clear that managers and leaders at all levels will need new knowledge and skills. In light of this, MLA and AMPC are currently reviewing a number of professional development and training initiatives to ensure that they facilitate the development of industry capacity to support future sustainability as well as improving current operations.

This project was part of a suite conducted by Kate Perkins of Kulu Pty Ltd to inform strategic discussions about the current and future needs of the industry generally, and to identify options for future development. While its immediate focus was on the Engineering Network and Technology Tour (Tech Tour), it also considered broader issues related to industry needs and professional development.

1.2 Project Objectives

- To evaluate the impact of the Engineering Network and Technical Tour on individual participants, their companies and, where possible, on the industry in general
- To consider what can be learned from these and other networks in regard to the provision of effective professional development within the industry
- To identify alternative approaches that might facilitate the development of the skills and knowledge the industry will need in the next five to ten years.

1.3 Methodology

The evaluation focused not only on individual participant and company perspectives, but also on the industry context, present and future.

1.3.1 Key questions

While it should be noted that the project was not intended to provide a comprehensive picture of all aspects of professional development in the red meat industry, the following questions provided a starting point for exploration:

- What are the critical issues facing the industry in the next 5 -10 years?
- What skills and knowledge will be critical?
- What are the implications for plant engineers and what opportunities are available for professional development in these areas?
- What do meat industry engineers believe it is important to know/be able to do?
- What role do they believe professional development plays in their performance, career development and interest in staying in the meat industry?
- What role do the Engineering Network and/or Tech Tour play in professional development for individual participants
- Where else do they learn more about new technology, operations, management etc?
- Who regularly attends the tours and Engineering Network meetings and why? What stops some company staff from attending?
- What specific outcomes, if any, can be attributed to their involvement?

- If they could design the ideal professional development program tailored to their own needs what would it be like?

1.3.2 Understanding the industry context

To establish where the industry needed to head in the next 5 to 10 years, workshops and one-on-one consultations were conducted with representatives of peak bodies and companies. Recent industry related documentation was also reviewed, with a particular focus on those issues identified as 'hot topics' by industry members involved in a range of network meetings.

1.3.3 Literature review

A brief review of research was conducted in regard to:

- the nature of innovation
- the management of change
- the factors that impact on an individual's professional learning
- the design of effective professional development programs
- Networks and Communities of Practice

1.3.4 Current professional development offerings

The review collected data on a range of red meat industry networks as well as on the Engineering Network and Tech Tour. Documentation regarding each program was analysed to identify attendance patterns. Face to face and phone interviews were also conducted with the facilitators of the Engineering Network and Tech Tour, and with the AMPC and MINTRAC coordinators/ facilitators of other networks. The reviewer attended the 2008 Engineering Network meeting in Brisbane in July 2008, but due to scheduling clashes was unable to participate in the 2008 Tech Tour as originally planned.

1.3.5 Participant perspectives

All participants at the 2008 Engineering Network spoke with the reviewer on the day of the meeting, and agreed to be contacted again at a later date. E-mails were also sent to all participants of the 2007 Network sessions, asking for those who would be prepared to participate in a phone interview. 30% of those contacted responded, almost all of these being regular attendees of the network, or staff of companies that have consistently supported the Tour.

18 interviews were conducted with the final group of interviewees representing eleven companies in four states. Some Network participants were interviewed twice, once on the day of the networking meeting and again several months later. The phone interviews were semi structured, and where appropriate, included some questions posed during the 2005 review in order to identify possible similarities and differences over a 3 year period.

Although it was originally intended that participants' line managers or company senior managers would also be interviewed, due to industry pressures at the time, this was only possible in 2 cases. However some of those interviewed were company owners or senior managers themselves.

1.3.6 Acknowledgements

The author would like to thank al those who contributed to this study, particularly the plant engineers, Network and Tour facilitators who were so generous with both their input and their time.

2 Literature review

A brief review of research was conducted in regard to:

- the nature of innovation
- the management of change
- the factors that impact on an individual's professional learning
- the design of effective professional development programs
- Networks and Communities of Practice

Appendix 1 has further detail on the review of literature on professional development and networks.

2.1 Innovation

Research demonstrates that the productivity, growth and ongoing competitiveness of firms is strongly influenced by their ability to innovate. (Green 2009)

The Business Council of Australia (2006) defines innovation as:

> *the application of old or new knowledge to create additional value and wealth.*

In its review of the National Innovation System, the Department of innovation, Industry, Science and Research (2008) observed that:

> *Innovation is not the opportunity; it is the imaginative response to opportunities*

A South Australian government paper (unpublished) saw the term referring to an interactive process that emerges when a clash of ideas, a fresh perspective or a fusion of expertise occurs.' There has been a great deal written about innovation and it was beyond the scope of this project to go into depth in the literature. However, some key aspects have been identified that are relevant to the development of a professional development framework and programs suited to fostering innovation.

Transformational innovation challenges 'the way we do things round here', involves a break with the past, and brings with it new ways of thinking and acting. Although it carries far greater inherent risk than *incremental innovation*, it also has the potential to transform the whole organisation in a way that incremental innovation cannot. (Clegg & Clark 1998 p227) (Table 2.1).

Incremental change	**Radical or transformational change**
Continuous improvement focus	Transformational
Maintains equilibrium	Moves organisation to a new equilibrium
Affects only part of an organisation	Transforms entire organisation
Implemented through normal structures & processes	Creates new structures and processes
Existing product or process improvement	Introduces new products, creates new markets or provides new solutions to major issues

Table 2.1:Incremental and Radical Industrial Change model (Clegg and Clark 1998 p227)

Whether incremental or transformational, research shows that the success of any innovation depends largely on how it is managed from initiation to implementation. (Kotter 1998).

> *Innovation ... involves much more than the transmission of knowledge down the pipeline of production from research to development applications. (Department of innovation, Industry, Science and Research (2008)*

No innovation succeeds or fails in a vacuum, but is introduced in a context defined by the complex interplay of structures, systems and attitudes. Therefore, an innovation needs to be viewed as a process, not as a single event. It needs to be managed strategically by focusing on the 'Big Picture', and using tactics with the greatest leverage to bring about the desired results. (Kim 1996)

Major technological innovations are likely to require a high financial outlay, and potentially major disruption to current production, so senior decision makers need a full appreciation of the benefits and costs before they will support the development of the idea, let alone its implementation. Almost invariably, technological innovations also impact on people and processes. To be effective, design and implementation should be approached as a formal change management process involving senior plant managers and HR staff, as well as technical staff

2.2 Managing change

If we are interested in creating enduring change, Kim (2001, p.83) argues that:

> *what we need is a very different theory about building shared commitment and vision to produce lasting results. We need to take a systemic view of the larger change process, and cultivate both a wide and a deep understanding of where we want to go (desired future reality) and be able to talk honestly about where we are (current reality).*

In order to better understand the current reality and identify strategies that will move a complex system towards a desired future reality, Kim (2001) suggests viewing the aspects of the system from each of five different levels of perspective:

- Vision (a picture of where you want to go)
- Mental models (values, beliefs, assumptions that drive behaviour)
- Systemic structures (e.g policies, processes, programs, organisational structures)
- Patterns of behaviour (such as those identified by research)
- Events ('one off' actions and activities that provide examples of desired or undesired behaviour).

Kim (1995, p.3) argues that the key to successful large scale change is to be able to view the system from, and act at, all levels simultaneously. However, it is important to recognise that our ability to influence the future increases as we move from the level of events to the vision. While this does not mean that high-leverage actions can only be found at the higher levels, actions here have more impact on future outcomes than on present events, so over time, their leverage will in fact be far greater. (See Fig 2.1)

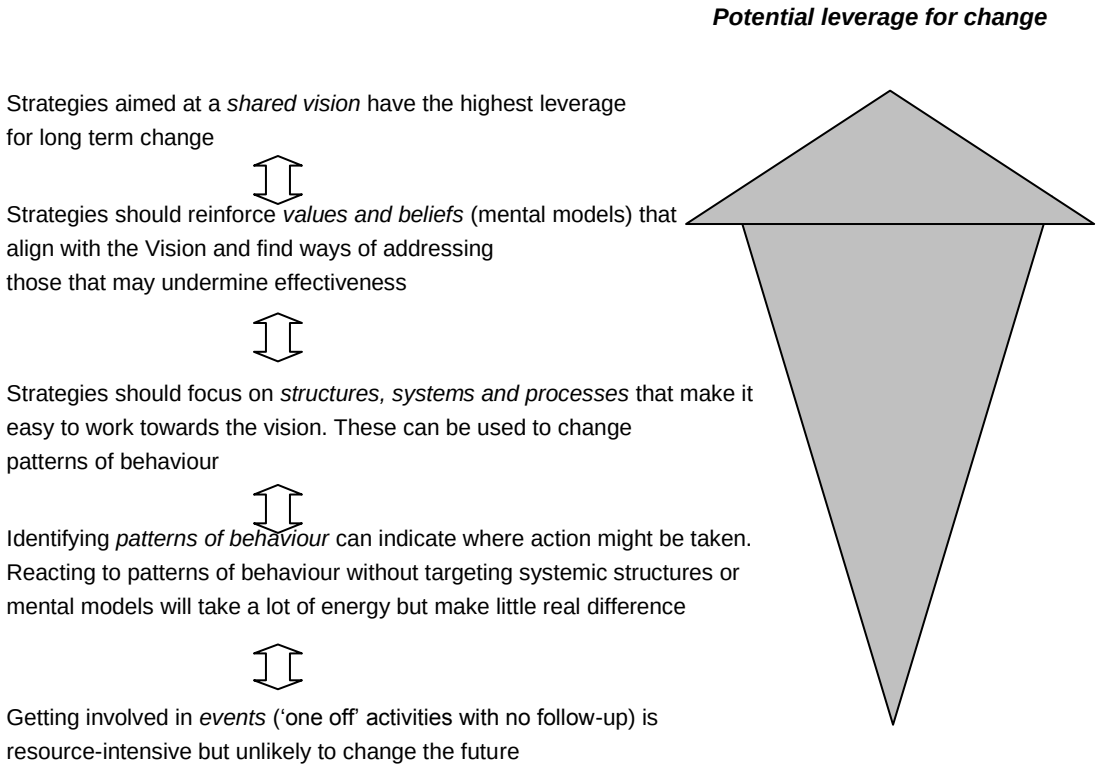

Fig 2.1. The Levels of Perspective (Kim 1995).

This model has been used to inform the development of the professional development framework. Industry members were consulted about their vision for the future and identified the mental models and types of structures and systems that would support its achievement. Aspects of this work have been used across the suite of projects being conducted as part of the professional development review.

2.3 Effective professional development

Many researchers (Kutner et al 1997, Ferry & Ross Gordon 1998, Maldonado 2002, Smith et al 2003, Cranton & King 2003, Poell 2004) have identified factors that facilitate learning and behaviour change. They all say the same thing - the most effective professional development approaches are likely to:

- be interactive, sustained and intensive
- incorporate action learning
- acknowledge and actively draw on a participant's current expertise
- encourage inquiry into existing beliefs, assumptions and specific practices
- facilitate sharing of knowledge by peers
- involve specialists where appropriate

Butler (1996) argues that there is little evidence that a person's practice is much influenced by the *public knowledge* that is transmitted through papers, manuals, professional development workshops and quality assurance processes. He suggests that what someone does is based on their store of lived experience, or *personal practical knowledge (PPK).* This in turn is influenced by a person's values, beliefs and assumptions. The strongest determinant of what a person will

do tomorrow is what they did yesterday, and the day before and the day before. To change behaviour, an individual must challenge their PPK and the underpinning values, beliefs and assumptions. However, this is unlikely to happen unless someone has the opportunity to reflect deeply.

Where someone is on the novice to expert continuum (Dreyfus and Dreyfus 1988) will influence the choice of professional development approach. A novice needs clear guidelines, and is best taught by someone who is competent- that is someone who knows the rules. Experts draw on their wealth of PPK to 'read' the context and quickly make complex decisions. They are the idea people to stretch and challenge those at the competent stage so they can learn and grow. Experts are not however the best people to teach novices or advanced beginners because experts know too much (including when and how to break the rules!)

Action learning offers a practical, systematic way of encouraging reflection and group interaction while managing a new idea through from concept to reality. It can also be designed to accommodate people wherever they are on the novice to expert continuum. Dick (1997) defines action learning as, 'a process in which a group of people come together more or less regularly to help each other to learn from their experiences'. The critical element is the adoption of a *systematic* approach to trying something, collecting data about what happens, reflecting on what has happened and using the learning to change subsequent action to continually improve practice.

The research informed the identification of a set of criteria for evaluating the potential of the current Engineering Network and Technical Tours to influence learning and behaviour change. (See Box 2.1)

Professional development that facilitates learning/behaviour change

- Acknowledges and connects with participants' prior knowledge and interests
- Recognises participants' current levels of expertise (novice, competent, expert)
- Facilitates interaction and knowledge sharing (between peers, with presenters and with technology)
- Encourages deep reflection, including inquiry into existing beliefs, assumptions and specific practices
- Involves specialists/experts where appropriate
- Supports a sustained focus over time
- Enables next steps/follow up, preferably through an action learning approach

Box 2.1. Criteria for evaluating potential impact of professional development on participants

2.4 Networks and Communities of Practice

Networks and Communities of Practice are two of the mechanisms that can facilitate professional learning**.**

A CoP is defined as a joint enterprise understood and continually renegotiated by its members, who are bound together by engagement in an area of mutual concern. (from Wegner 1998, pp2-4). A CoP has a specific focus, and people come together because they are interested in that focus. As they meet over time, they build strong relationships, based on trust and respect. A

network on the other hand is established to build relationships (for example between engineers in the meat industry). Focus topics are a secondary (although still important) consideration, providing a vehicle for the building of mutual interest, trust and respect. It is easy to see why there can be a fine line between the two, and why the terms are often used interchangeably.

A study of technology transfer through networking groups amongst manufacturing companies in Missouri (Amos & Tubbs 2001, pp1-2) found that the sharing of ideas was an important part of the problem solving process, and that working with others was a 'powerful and meaningful' problem solving tool in its own right. Sharing technical knowledge and personal opinions helped reduce the stress involved in making decisions. Obtaining ideas from others was especially important for managers who were operating alone in their own organisations, as they did not ordinarily have the opportunity to seek advice from others and usually [felt] very alone'.

Factors affecting the success of a network are outlined in Table 2.2.

	Factors affecting network effectiveness	**Optimal conditions**
1	Group size	Small to allow for interaction and the building trust
2	Group make up	Members should be from organisations of similar size if possible
3	Regularity of meetings	Preferably monthly
4	Quality and regularity of member participation	Group membership needs to be relatively stable Members need to attend and contribute Members prepared to share stories and ideas, and offer assistance
5	Level of member interest and commitment	Members need to set and own the agenda Vibrant meetings with momentum maintained throughout by effective facilitation
6	Degree of emphasis on member input and interaction	Opportunities to discuss problems/issues with peers who have had similar experiences. No lectures
7	Degree and nature of 'outside' involvement	Experts may add value but should not dominate Suppliers should not usually be involved as they are likely to inhibit sharing and to be seen as having another agenda
8	Quality and nature of facilitation	Facilitator as enabler- • listener not lecturer • effective facilitator of proceedings to keep things on track and maintain momentum • manager of logistics (agenda, field trips, meeting venue etc) • role in ensuring topics remain of interest and in rallying members to attend regularly

Table 2.2. Factors affecting network effectiveness

The greatest challenges for a network's facilitator are in maintaining strong participant interest in the topic(s) and commitment to the group, and in ensuring that participants feel they are providing and obtaining valuable information. This means being a good listener and elicitor of information and ideas. The facilitator also needs to manage logistics effectively, selecting appropriate venues, and maintain contact with members to ensure they attend regularly.

An effective network is not a mini conference dominated by presentations. ‘Network members want to talk and interact; this is what makes networks more meaningful than having a large conference or seminar.’ (ibid). While it can be appropriate to add value by arranging field trips or inviting a guest expert, Amos and Tubb suggest that it is not a good idea to allow service providers access to the group because this may detract from the purpose of the network as a problem solving group, and because the presence of outsiders tends to discourage members from speaking openly about their concerns (ibid p.4)

The research was used as the basis for a set of network evaluation criteria. See Box 2.2.

An effective network:

- is focused on supporting its members in problem solving
- is made up of a small numbers of regular attendees
- meets regularly
- has an agenda set by its members
- enables airing of issues and sharing of ideas amongst peers
- emphasises two way communication, centering around interaction between members rather than information dissemination through lectures and presentations
- employs an effective facilitator to maintain a focus on member needs, ensure meetings stay on track and manage logistics
- may invite experts as required but does not involve suppliers

Box 2.2. Criteria for effective networks

2.5 Towards a professional development framework

2.5.1 What should PD programs in this industry aim to achieve?

What does the industry actually want to achieve through networking and professional development activities?

Drawing on input from interviewees and several workshops involving industry and representatives of industry peak bodies, a set of guiding principles was identified and a draft professional development framework developed for use across the suite of projects. These have been used to identify the strengths and weaknesses of the programs under review, potential synergies between programs and gaps that need to be addressed.

2.5.2 Guiding principles

The focus group identified a set of guiding principles to be taken into account in the design and delivery of a cohesive, integrated approach to industry professional development:

- Industry members need to drive the process. Although it may not be possible to get widespread industry buy-in to all programs, it is essential that key industry leaders are supportive and, where possible, directly involved.

- Industry bodies such as MLA, AMPC and Mintrac have a key role in facilitating, coordinating and providing appropriate support structures and resources to assist the process, but ultimately industry must own it.
- It is important to attract new people to the industry, but also to recognise and develop the industry's internal (and often 'dormant') talent. i.e. those who have already made a commitment to the industry
- All programs must respect and dignify the roles that people play at all levels of the industry, and value the knowledge and skills they each bring to the process.

2.5.3 Draft professional development framework

Those consulted identified a range of possible goals for professional development (See Appendix 4). These provided the basis for the development of a framework with the following overriding aim:

> To ensure that the industry has access to the knowledge and skills it needs to be profitable and sustainable.

Major goals to be achieved in the process of achieving this aim:

1. Identify what the industry needs
2. Ensure the industry owns and drives the process
3. Lead and manage the industry-wide program
4. Develop current industry members
5. Attract and develop new graduates in relevant disciplines

The aim and goals were validated by senior managers interviewed for this and other related projects.

Due to its size, the full diagrammatic framework is provided as a separate attachment.
However, Figure 2.2 provides an overview.

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Full steam ahead: A blueprint for professional development in the Australian red meat industry

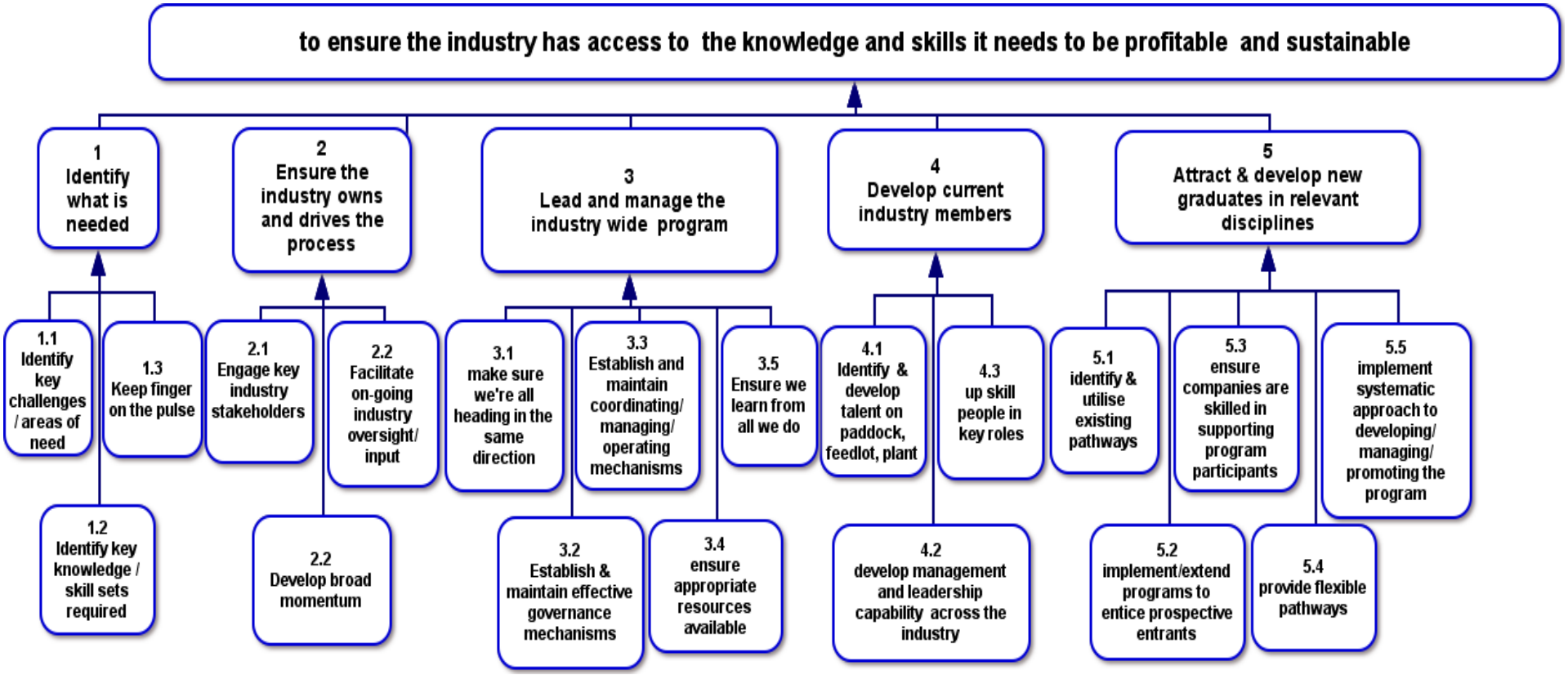

Fig 2.2. Overview of draft professional development framework

3 The Industry context: Findings and implications

3.1 Industry trends and challenges: Common themes

It was beyond the scope of this project to conduct major research in this area. However, although the trends and issues outlined below may not be all-encompassing, they do provide some insight into the challenges facing industry members in the years to come, and give an indication of the skills and knowledge the industry will need if it is to be sustainable. (See Appendix 3 for further detail).

There were strong common threads running through the feedback from different members of the industry sector. They observed that red meat processors face the daily challenge of keeping their plants running effectively. Downtime and on-going maintenance can impose heavy costs on an industry that already operates on low profit margins, and this is particularly evident in ageing plants. Plant engineers have traditionally been responsible for operational efficiency and are always on the lookout for solutions that can be implemented quickly, without major disruption, and preferably at minimal cost.

They reported that industry also faces challenges such as labour shortages, water and energy costs, availability and environmental impacts, and increasing legislative requirements in regard to environmental practices and food safety. Community values and perceptions in regard to food safety and quality are also changing, with an increasing emphasis on what constitutes a healthy diet and an emerging ethical focus on what foods should be eaten and how food should be produced.

Critical issues identified included the need:

- for general modernisation, including increased automation
- to anticipate and respond to increasing regulation
- to manage an increasingly multi-cultural workforce
- for new marketing approaches
- to invest in on-going training

Interviewees and focus group members observed that there was an overriding need for new ways of doing things in every facet of the business, and felt that much of the innovation needed to be ‘radical’ or ‘transformational’ rather than incremental.

3.1.1 How is the industry managing innovation?

Those interviewed believed that only a small number of companies are currently operating in the ‘mature and sophisticated’ fashion required to manage the identified trends and issues effectively. Some are prepared to consider incremental change, but others are openly resistant, believing that the old ‘seat of the pants’ approach will suffice. (This is supported by anecdotal evidence that in the last 5 years, on average only one site per year has been involved in extensive process upgrading - and this pattern is predicted to continue).

Companies have always operated on narrow margins, and the recent global downturn is increasing the pressure. High costs and delayed return on investment may make it harder to get companies interested in innovation. Increasing resentment of regulation that brings high costs,

but is not perceived to add value, may also limit developments in the environmental arena if they are not driven by legislative requirement.

3.1.2 What knowledge and skills will the industry need?

In line with other Australian industries, there is a general recognition of the need for higher level skill sets. While the industry (supported by MINTRAC) has done considerable work over many years to develop and update the industry training package to capture the skills sets needed by process workers at various stages of their careers, there has not yet been a similar focus on the needs of middle and senior managers, or on those in specific positions, such as plant engineers and environmental officers. However, the recently established national Leadership program is a step in the right direction.

Those consulted on skills sets for future leaders and managers identified the following as critical:

- A 'Big Picture' perspective
    - Leaders and managers cannot make decisions in isolation. They need to keep up to date with what is happening across the industry
- Strong networks
    - Being well connected across the industry makes a significant difference to the ability to keep up to date and to make things happen
- Know-how
    - Leaders and managers need the knowledge and technical skills specific to a role to be able to do the job effectively, or enough understanding to provide leadership for specialists to design and implement innovations
- Confidence
    - Leaders and managers need the knowledge and associated confidence to be able to hold their ground with regulators

4 The Engineering Network and Technical Tour

This section provides background on current industry networks, including the Engineering Network and Tech Tour, a summary of project findings and associated discussion.

4.1 Industry technical networks

4.1.1 A brief history

Over the last 10 years, a range of mechanisms, including the Engineering Network and Tech Tour, has been established to facilitate information sharing, technology transfer, and networking. These include MLA and AMPC web sites and publications, a number of networks and a community of practice. While some of these have a range of goals, each is intended to provide a means for participants to develop industry/technical skills and knowledge. Each provides a means of bringing people with different specialisations together to build links and forge the relationships that are a critical aspect of leading and managing effectively. In other words, they are mechanisms for professional development.

From 2001 to 2006, AMPC and MLA provided funding and ongoing support for Technical Network Groups in five mainland states. The original intention was that these groups would act as a technical transfer mechanism for small to medium red meat processors, help to initiate industry research activities and provide professional development opportunities for technical staff. While the networks in WA, SA, NSW and Victoria did not specify which technical staff should attend, the Queensland network group (founded in 2003) was specifically promoted as the Queensland Engineering Network. Originally, the networks covered a broad range of topics identified by participants and/or the facilitator, MLA or AMPC. From 2004, the NSW group attempted to boost attendance by focusing specifically on environmental and QA issues, and separate groups evolved. From 2003, all groups were offered the opportunity to organise subsidised study tours that would enable them to visit sites and network over several days. However, only the facilitator of the SA and WA groups took up the offer, and began running a combined SA/WA Tech Tour each year.

A review of the network groups (Perkins 2005) found that 72% of all red meat processing plants in the Australian mainland states had sent a representative to at least one network group meeting. While small, medium and large plants were all represented, the most consistent attendees were staff from the more successful medium to large companies. Regular participants strongly supported the networks, valuing the chance to network, being kept up to date on issues affecting the industry and the opportunity to access relevant information and ideas. While participants placed the highest value on networking, most commented that it was the *combination* of the three aspects that ultimately made the groups worthwhile. However, despite the high level of company representation over time, the review also found that facilitators had to invest a lot of time and energy to attract participants to each meeting, and that despite this, groups were generally struggling to sustain what were perceived to be viable numbers.

In 2006, Mintrac took over the running of the technical networks in SA, WA, NSW and Victoria, refocusing them more specifically as separate network meetings for Quality Assurance/Meat Inspectors and Environmental managers. At the same time, the Queensland Engineering Network and SA/WA Tech Tours were officially made national programs, while maintaining their formats and facilitators.

4.1.2 Current network participation

Key amongst the current networks are:

- The AMPC Greenhouse Challenge Plus
- The MINTRAC Meat Inspection and Quality Assurance networks
- The MINTRAC Environment Manager networks
- The MINTRAC Training Managers network
- The Meat Industry Leadership program (See Box 4.1)

A snap shot of current Industry networks

The *Greenhouse Challenge Plus* is the longest running processor 'community of practice'. Involvement is voluntary, with the group currently having 26 reporting members from all mainland states. Participants include 6 of the largest 10 companies and over 1/3 of total red meat industry production (based on 2005 figures). Participants meet several times a year. Each company is supported to establish base line data, identify potential projects to reduce greenhouse gas emissions and monitor changes over time. Some participating companies have received grants to support them in designing and implementing innovations, and awards for their efforts (AMPC website 2008)

The QA/MI Network and *Environmental Managers Network* meetings are held in 6 different locations nationally. Each is organised and facilitated by MINTRAC and the two meetings are scheduled on the same day at each location to keep the facilitator's travel costs down. This also means that representatives of other industry bodies such as AMIC, AMPC and MLA are also likely to attend both sessions. Both networks aim to facilitate communication between industry and regulators, identify and address training requirements and provide professional development sessions to address immediate and specific information requirements (MINTRAC 2008 website).

The Training Managers Network is also convened by MINTRAC and aims to provide an opportunity for training/HR managers to 'get an understanding of how their company can access industry funded training and what cooperative activities can be undertaken.' (MINTRAC 2008)

The *Meat Industry Leadership Program* is the most recent addition. This national 2 year program for graduates of the Diploma of Meat Processing, offers an Advanced Diploma but has also been deliberately designed to hep participants bud their industry networks, linking them not only with their peers, but with industry leaders and experts in specific fields.

Box 4.1: Current industry networks

Twenty companies were identified as medium to high users. (High users participated in 5 to 7 activities, medium users in 3 or 4). Table 4.1 shows patterns of regular participation in MLA/AMPC facilitated networks for 2007 and 2008. (Attendance at the Water Conference in 2008 was also included as it was mentioned so many times as an example of a useful forum).

Table 4.1. Medium to High Industry Network users 2007-8

Companies	Engineering	Tour	Environment	Water re use conference 08	Greenhouse Challenge	QA/MI	Training	Total
CRF	YES	YES	YES	YES	YES	YES	YES	7
Fletcher		YES	YES	YES	YES	YES	YES	6
Midfield		YES	YES	YES	YES	YES	YES	6
Teys	YES		YES	YES	YES	YES	YES	6
Cargill	YES	YES	YES	YES	YES	YES		6
JB Swift	YES		YES	YES		YES	YES	5
T&R	YES	YES	YES		YES	YES		4
Monbeef			YES	YES	YES	YES	YES	4
ACC	YES	YES	YES		YES			4
Harvey Beef		YES	YES			YES	YES	4
Kilcoy	YES		YES	YES		YES		4
Tatiara			YES	YES	YES	YES		4
Thomas Bothwick			YES	YES	YES	YES		4
Oakey/Nippon	YES			YES	YES	YES		4
Bindaree		YES	YES	YES			YES	4
Churchill	YES		YES			YES		3
QAF				YES		YES	YES	3
Norvick				YES	YES	YES		3
Hardwicks			YES	YES			YES	3
Castricum		YES		YES		YES		3
TOTAL	9	9	16	16	12	12	17	

A recent evaluation (In2it 2007, p.3) found that the QA/MI Network facilitated by MINTRAC had been successful in building industry support because it provided the chance for participants to meet like minded people, provided credible, current, useful information and opportunity for participants to meet with, and influence, policy makers and regulators (whose representatives are directly involved in the group over time). Amongst the top 20 network users The QA/MI and Environmental networks have the highest numbers of participants. There are some 26 companies involved in the Greenhouse Challenge Community of Practice, although only 12 of these companies are also regular participants in three or more of the other network opportunities.

4.2 The Engineering Network

4.2.1 The size and scope of engineering in the meat industry

It is not known how many people in the industry are designated ‘engineers’. (The facilitator of the Engineering Network has identified over 50 engineers from 37 companies, and these people receive personal invitations to meetings. However, some of these contacts are also responsible for one or more other engineers who re not listed, but who may also attend meetings). Nor is there data on the qualifications of plant engineers in the meat industry, but it is known that there are a mix of degree qualified and non-degree qualified engineers with backgrounds in trades such as electrician, and fitter and turner. Degree qualified engineers are a relatively recent addition to the industry, and still in the minority.

While some large companies employ a chief engineer at senior management level, plant engineers tend to be middle managers overseeing a group of maintenance workers. While some companies, (usually the larger ones), employ environmental officers as well as engineers, in many companies, engineers have also taken on this responsibility.

Those interviewed for this project suggested that the majority of engineers are focused mainly on maintenance, They tend to have middle manager status and are unlikely to play a lead role, or to have a strong influence on high level decisions.

4.2.2 The goals of the Engineering Network

The Engineering Network is facilitated for MLA/AMPC by Food Science Australia and funded each year as a project with objectives to be met as part of the contract. In 2008 these were to:

- have formally established contacts between engineers from processors throughout Australia
- established in consultation with participants the subjects to be discussed at network meetings
- prepare a program, organise a suitable venue and arrange suitable presenters on subjects of interest for each meeting
- provide feedback to MLA and AMPC regarding industry concerns and needs for technical support, training, research and development.

It is intended that two meetings will be held each year, but only one was held in 2006 and 2008 due to delays with contractual arrangements. Meetings have been held in various locations in Southern Queensland, but most regularly in Brisbane. Most are held on one day, with various start and finish times from 8.30 am to 4.30pm. However, the March 2007 meeting was held on the Friday afternoon before the opening of the Australian Country Choice boning room on the following day.

While the Network is clearly pitched at plant engineers, it also attracts several company owners with an interest in the engineering side of the business. The number of meat company participants at each meeting varies considerably, with numbers between 2005 and 2008 ranging from a high of 28 to a low of 9. See Table 4.2.

Year	Location	Participant numbers	Companies represented
Nov 2005	Fosters Yalata Brewery, Beenleigh Qld	20	16
May 2006	Meeting Hotel Carrindale Brisbane ACC Boning Room site visit Cannon Hill Qld	28	19
March 2007	Beaudesert Community Sports Club Site visit AJ Bush	11	8
July 2007	Food Science Australia Cannon Hill	9	6
May 2008	Visy, site visit & meeting	12	9

Table 4.2. Participant numbers at Engineering Network Meetings since 2005.

Who gives presentations?

Approximate percentages for meetings since Nov 2005:

- 40% by consultants/technical sales people
- 27% of presentations (other than site visits) by plant engineers
- 15% by specialists (e.g. Genetic Solutions on DNA testing in traceback, FSA on vision and sensing programs)
- 12% by regulators (e.g. EPA, AQIS)
- 6% by MLA representatives.

Box 4.2: Source of Network presentations

4.2.3 Company participation

Since its inception in 2003, the Engineering Network has involved 70 participants from 32 companies, 50% of which are Queensland based. (See Table 4.3). 10 companies have been consistent participants. Nine of these are based in Queensland. (It is not useful to compare participation and attendances before and after the network went national as there were 6 sessions held before 2006 and only 4 since). 12 companies have only sent participants to one session. However, 4 of these are WA based, so it is somewhat surprising that the have sent anyone at all. (See Table 4.3 for a breakdown of participant numbers and attendance by state). There have been some shifts in participation since the 2005 review, with several companies starting to participate even as others have disappeared. Distance still seems to be an issue, with only two non Qld/NSW companies sending participants since the network became 'national'.

State	Queensland Engineering Network Company numbers to Dec 05	The Engineering Network 2006-08	Total 2003-2008
Qld	13	12 (9 continuous, 3 new)	16
NSW	5	4 (1 continuous, 3 new)	8
Vic	2	2 (1 continuous)	3
WA	4	0	4
SA	0	1	1
Total	**24**	**19**	**32**

Table 4.3. Company participation 2003-2008 .

Attracting participants involves extensive canvassing by the facilitator. Some participants are 'regulars', but there is limited consistency of attendees over time.

State	Qld Engineering Network (6 meetings) Participant numbers/ Total attendances to Dec 05	Engineering Network (4 meetings) Participant numbers/ Total attendances 2006-08	Total 2003-2008
Qld	27 participants 52 attendances	27 participants 43 attendances	**41 participants** **95 attendances**
NSW	9 participants 10 attendances	9 participants 7 attendances	**14 participants** **17 attendances**
Vic	4 participants 5 attendances	9 participants 11 attendances	**9 participants** **16 attendances**
WA	5 participants 9 attendances	0 participants 0 attendances	**5 participants** **9 attendances**
SA	0 participants 0 attendances	1 participants 3 attendances	**1 participants** **3 attendances**
Total	**45 participants** **79 attendances**	**46 participants** **61 attendances**	**70 participants** **140 attendances**

Table 4.4: Engineering Network participation by state

4.2.4 Network costs

Averaging out the last 4 meetings, the Engineering Network has cost MLA/AMPC about $1000 per attendee. Individual companies pay attendees' normal wages (they are not usually replaced for the day) and travel expenses. As most participants are from Southern Queensland, travel is likely to involve petrol costs and a very long day for the staff member involved. Although cost does affect the potential to attend, it does not appear to be a major consideration for those companies that have been regularly involved over time. However, travel time and costs for those in other states may be one of the factors limiting the evolution of the network into a genuinally national event).

4.2.5 Program content

The program is deliberately designed with a wide selection of topics in the hope that each participant will find something of interest. The facilitator makes a concerted effort to gain participant input into the agenda, with variable success. Participants may propose topics on meeting feedback sheets, or in communication with the facilitator between meetings. MLA, AMPC and the facilitator also identify possible focus areas, which the facilitator may put to regular attendees to gauge the degree of interest.

Topics over the 5 sessions from December 2005 to 2008 have focused on:

- Preventative maintenance
- The application of 'Lean' to plant maintenance
- Refrigeration
- Plumbing and drainage
- Cleaning and sanitation
- Traceability
- Vision and sensing
- Water efficiency
- Greenhouse gas and energy regulation
- Renewable energy

Site visits have been arranged to Yatala Brewery, ACC, Food Science Australia, AJ Bush and Visy Paper Recycling.

Meetings focus on a series of presentations, with limited time for questions, plus a site visit. (Where possible, the meeting is held on site). Meetings since 2005 have involved between 5 and 8 presentations, plus a demonstration or site visit. The presentations have been made by plant engineers, industry consultants, specialists in particular fields, sales representatives, regulators and MLA representatives. While company members have provided about a quarter of presentations (other than hosting site tours), 40% have been made by industry consultants and sales representatives. (See Box 4.2)

4.2.5.1 Participants, their companies and change

Although a small number of participants were in a position to make decisions regarding major change, most did not have that level of authority, and were not directly involved in planning.

> *Our company has some big things planned but they aren't announcing them to any of us until next year.*

Participants' perceptions of their senior managers' interest in change varied considerably. One saw his company as genuinely committed to implementing transformational change:

> *I think we are a leading edge company interested in change. Our CEO is a mover and shaker who wants to make a difference. He puts things out there and drives us to try them and make mistakes and learn from them. He sent me to the workshop on lean and has supported what we've done ever since. I think we've learnt that real change doesn't happen quickly. It's taken us 3 to 5 years to really turn things around, but now it's stating to show on the measures. Our sick days are halved. We don't have the turnover of people we used to have. Six years ago if I advertised a position I'd get no applicants. The other day I advertised for a gardener and got 18 applications because the word is out that this is a good place to work.*

Another reported his company was adopting a systematic approach to change:

> *We've got so many balls in the air, the CEO has got an innovation manager to look for the best opportunities and make sure people aren't going off in different directions.*

However, the majority felt that their companies were wary of change in general, and that they were usually focused on immediate financial issues in a way that made innovation very difficult.

> *Our execs are gun-shy about being leading edge. They say they don't want to be on the bleeding edge! They want to know something will work in our industry before they'll try it. But I know the business needs to invest in a range of things- like better water use.*
>
> *I'll come up with something and the family member who makes the decisions will say, 'What's the payback?' His focus is always very short term, so even though I can show him how an investment now will have a pay back he's not interested if it isn't right away. (Several specific examples were given).*
>
> *I couldn't take our GM to a network meeting, he wouldn't want to come, but if you were going to implement some of these ideas you'd have to get someone else involved to push it through.*
>
> *Major change needs a champion. That wouldn't be our GM- we try to keep him out of anything we're doing as much as possible! We do it and then we tell him*

Some participants were unsure about some of the innovations being proposed for the industry or questioned where the emphasis should be placed.

> *We've got another company's building some robots here but I don't think it'll ever work. It isn't costing us anything but I can't see the point.*
>
> *Maintenance costs a lot. It needs support along with innovation.*

A company owner observed, 'Last year no-one made any money so no-one's going to be putting much into R&D are they?' Others commented on the way in which hot topics like carbon trading had 'gone off the boil once the government backed off.

4.2.6 Why do people go?

> *It's about the only way you and find out what people are up to. Mind you, that's why some companies don't come, because they don't want anyone to know!*
>
> *It's not a bad way to keep in touch.*
>
> *We don't often get an opportunity to talk to each other. It can be pretty isolated especially in the regional areas.*
>
> *It's the only way to find out what's happening out there, especially for people in the middle of nowhere.*
>
> *It's a good way to crystallise information when you're away from other pressures*
>
> *The biggest thing is to bring what you hear back to make a difference. You've got to bring one or two things back or it's a waste of time.*
>
> *The networking- it's of more value than the topics*

Some also identified what stopped them from coming.

> *My boss is the group engineer. He thinks these networking sessions are a junket, so I've only managed to come to a couple.*
>
> *If it's in Brissie, and we're going to have to cross the gateway bridge on the way back it could take us 3 hours to get home. That makes a 12 hour day so well think twice about coming.*
>
> *I go to most. It's a chance to get to now people and make face to face contact. If I miss one it's only because of other commitments not because of that meeting's program.*
>
> *You look at the program and where it's being held and decide if it's worth it. I didn't go to one because I'd been to the site before. It was a 50:50 toss up that I'd learn anything new.*
>
> *It depends a lot on where it's located and the topics. As long as there's half of it that I'm interested in I'll try to come.*

4.2.7 Participant perception of usefulness

In alignment with the previous review and with evaluations of other industry networks, almost all saw networking as the major benefit of going.

> *I've never experienced this level of sharing in the industry before. I feel very positive compared to my other experiences*
>
> *This network is part of building collaboration across the industry that has traditionally not been there. It's very important if the industry as a whole is to be competitive, but it isn't easy to quantify.*
>
> *The Network definitely has its place. It's the information you get from other people with like interests that's valuable- it's not in the script!*
>
> *Surprisingly people who go to the network don't have many secrets. They always say 'Come and have a look'*

> *It can just be the small bits of information you pick up- it's useful.*

Engineering Network participants could identify a limited number of specific topics that had been of interest to them, but few had taken any action as a result of information provided at a meeting. Any action that had been taken after a meeting were likely to involved contacting someone they had met during the breaks to ask for assistance.

> *You'd never do it if you didn't have a face to go with the name, but once you've met someone you think- he's not a bad bloke. Maybe he can help.*

Several interviewees observed that the industry was getting a lot more open at the operational level, and that people would help each other out, even if there was resistance to this at senior levels of the company. Some also thought that the companies that sent participants tended to have a culture that was open to new ideas and that they were prepared to share (at least to a point!)

> *I try to come at least once a year and I find it useful. We're happy to have people come to our plant and follow up on things we've presented, although we've got to be a bit careful.*
>
> *I go because it's easy and close. Networking is of bigger value than the topics themselves but I've put up a couple of topics and Neil's followed through. To be honest I'm interested in about a quarter of the topics. Some are right out of my field. But when they're on I find other things to plan. I'm a big fan of having time away to reflect on bigger issues. I still now it's work time but I'm not distracted.*
>
> *The network definitely has a place. Where do you go if you don't have it?*

Participants also valued the opportunity to find out what other industry and non-industry members were doing, preferably through a site visit or through a presentation by a peer.

> *I want to hear from someone who's done it in this industry if possible, not from someone who wants to sell me something but might not have ever worked in this industry at all.*
>
> *You need to hear from someone who's been through the process, not a salesman. They can tell the story even if they're not great speakers.*
>
> *You only want to hear about things that are proven in the industry.*
>
> *I'm skeptical of some people pushing things like lean. I ask, 'Are they looking after themselves or after the business?*
>
> *We're just under the benchmarks for carbon trading reporting at the moment but we need to know about it. I appreciate getting the information from someone who knows our industry not from a government website.*

Areas of interest varied. Most participants reported finding at least one thing per session that held their interest. Several commented that they switched off during sessions that they did not feel were relevant to their situations, but did not mind, as they spent the time thinking about what they were doing at the plant, and making plans.

4.2.8 Appropriateness of the current format

While some companies employ one or more junior engineers and are able to send several people to a meeting, in most cases, the senior engineer attends alone. Thus, the majority of participants are experts with many years of experience behind them. Those interviewed described themselves as practical, hands-on sort of people. They were also those who reflected deeply on their role and on the challenges they faced. They recognised that many required more than a quick fix and welcomed any assistance they could get in working through the complexities. They appreciated the opportunity to 'think things through', and generally found that 'having a yarn' with other people helped this process.

> *Usually, only about 1/4 to a 1/3 of the topics will be of interest. But when it's something I'm not interested in, I find something else to plan!! It's quite useful.*
>
> *I'm a big fan of having time away to reflect on the bigger issues. I still know it's work time, but I'm not distracted.*
>
> *If you're in a group of 6 to 12 people you can discuss the problems you've brought along. It's not a social thing.*

However, there was no time in the 2008 meeting for any structured sharing of information or ideas amongst participants, and very little time for questions of presenters. As the breaks were relatively short, and most participants left as soon as the meeting finished, or even earlier in order to be on the road home in good time, there was little opportunity for informal networking either. Presenters did not attempt to find out on the day what knowledge people had of the topics, and there was no time allowed for people to make connections between what they heard and their own contexts and experience. This was particularly evident after the site tour of the Visy paperboard plant, when some structured discussion with the plant manager, and with each other, could have helped participants make connections with their own plants and sparked more ideas than a person thinking alone is likely to generate, (even if they did have time to do this).

> *It's hard to hear so much and digest it all, especially without talking about it.*
>
> *For some of these topics you really need more of a workshop with a good facilitator.*
>
> *It's good to have a concentrated time to listen and talk –maybe we could do with a longer lunch break or something. Maybe a 5 minute discussion led by the presenter, Otherwise it's hard to hear and digest everything.*

The group was large and positioned round one long boardroom table. This organisation worked against some people raising questions or sharing their own experiences during the short question time, as some participants were not prepared to comment in front of the whole group.

For example, after the 2008 session, one participant observed,

> *I didn't agree with that bloke about collecting gas back off the effluent ponds to save money. He's right out with those figures he gave. I've checked it out and the economies aren't there…. No I didn't take him on. I'm not one to speak out. I'm a listener. I listen then I make up my own mind.*

He said he would have been comfortable to 'have a yarn about it' if there had been time. In the same meeting, there were also two presentations about the lean approach and its application in the meat industry, taking 1.5 hours in total. While one participant later said he'd found it interesting and his company might follow it up, (but had not done so 4 months after the event), several others made comments based on very different perceptions, and possibly misconceptions, about what 'lean' was actually about.

> *Oh that maintenance thing? It takes a fair bit of time to set up and I can't see the value of having someone sitting at a desk working on a computer when you could just use spreadsheets.*

Another said, somewhat tongue in cheek, 'You mean the Soviet collective approach? No I'm more into guided dictatorship.' A third said, 'Lean- I'm aware of it - I think it's been discussed on site- but my basic take is that a lot is just common sense. I like to think we do it naturally, we just don't call it lean'. There different perceptions would have provided the basis for a challenging discussion during the network session, but there was no time set aside for such a thing.

During this meeting, there were indications that participants wanted to discuss what they were hearing. Some made low asides to each other during presentations, and by the last session, a group at the back simply ignored the speaker and had a conversation amongst themselves.

What input did participants most value?
Although they were prepared to have specialist presentations, and to hear from regulators, participants placed the highest value on input from other industry members. They said they would rather hear 'war stories' from others within the industry about what works and what doesn't than listen to an expert who might not have the same level of specific industry experience. While many commented on the fact that members of the industry were often averse to sharing information and ideas, they particularly valued the contributions from those at the Network, and felt it had, to some extent, created a context in which traditional barriers came down.
Most of those interviewed raised the involvement of suppliers as an issue. In fact, there was a strong message from the pragmatic and sceptical audience that such people lacked credibility. (This supports the research which suggests that involving service providers/suppliers in Network programs is detrimental).

4.2.9 How do participants prefer to learn?

Most Network and Tour participants said they say themselves as 'hands-on' learners, who wanted to actually see new technology and processes, preferably in situ. Before they would buy into a new approach, they all emphasised that they needed to hear from someone in the industry who was already using it- warts and all.

> *You've got to get out of the plant if you want to learn.*
>
> *You need to see how things are applied and hear people in the industry who've done it talk about it.*
>
> *MLA does a good job in keeping people up to date on what technology is available and where it is applied- where it's being used – that's the key thing! You believe about a quarter of what you see, but 90% of the battle is won if you can see and talk to someone who's using new technology already. It's much easier to sell innovation with real examples. It reduces the risk.*

> *There's a fine line between being told about new products and someone promoting their product. It can be a bit snake oily. I want to hear from someone in the industry who's done it.*
>
> *You should only have things on the program that have been used in the industry already. It's really helpful to hear from people about what works and what doesn't.*
>
> *Make it easy. Send me an email with a web site link and whet my appetite. I'll click on the link follow it up- but if I haven't got to what I want in 5 to 10 minutes that's it.*

While not wanting to listen to salespeople at Network meetings, one participant of both the tour and Network had identified some suppliers he trusted to keep him up to date in some areas.

> *I deal with two very large refrigeration companies. I talk with them about whatever is new and I feel this is the best way for me to keep up in this particular area.*

Most appreciated the small group format.

> *A lot of engineers are introverted so they don't speak up in a big meeting or conference.*

However, most felt that the small group interaction could also be fostered in large conference break out sessions

4.2.10 Suggestions for improvement

All reported finding it extremely difficult to find the time to follow up on new information and ideas once they returned to their plants, but felt that there were ways that a networking program could help.

> *We get so many bits of paper I don't have time to read. I don't go to websites unless I have to.*
>
> *We're working on an extension to the plant. It takes time trying to talk to everyone you have to but you have to have a yarn to sort it out*
>
> *I don't necessarily know what questions to ask. For me to do a search might take 5 hours and I wouldn't necessarily come up with the right answer. Mini-presentations that cover the essentials could really help you – at least to get you on the right track.*
>
> *Make it easy. Send me an email with a web site link and whet my appetite. I'll click on the link follow it up- but if I haven't got to what I want in 5 to 10 minutes that's it.*

No-one interviewed reported problems with attending a meeting for a full day. In fact, most saw two day meetings as a more attractive option, offering time to interact during the meeting, and networking over dinner.

> *Once you get off site, it's just as easy to go for two days as for one.*
>
> *One day is too rushed. You should have enough time to look at a site and sit down and really talk about it.*

> *From my point of view having a meeting on Saturday is fine. Most people are used to 6 day weeks anyway. Maybe start at 2pm on Friday to get more value from the effort of travelling. It would give a lot more networking time.*
>
> *Have a 2 day meet. It wouldn't be hard to sell to the boss because the fixed costs are the same, but it would be much better especially as you could run workshops as part of it.*

At some of the smaller plants, the engineers also covered environmental issues, but found it a challenge to go to both network meetings. They wondered if it would be more sensible to combine the meetings or to combine the two networks and hold 2 day meetings. Others, however, still liked the idea of an engineering network which offered potential to look at environment plus a broader range of issues. There was also interest in theme/issue based meetings which might involve people with a range of roles.

Several people suggested holding network meetings before or after other major events.

> *Hold the Engineering Network meeting at the same time as something else- for example, the AMPC Technical Committee so we can save some travel dollars. A good one would be after the Foodpro in Sydney. It's a real draw card – we sent 6 people to it – so it would be easy to stay on for an Engineering meeting. Or after Auspack. You could hire a mini bus and fit in a site tour to somewhere like Arnotts. Seeing other industries is good.*

Some proposed full scale conferences, referring back to those that used to be available for engineers, but others were not convinced that a conference should replace the network, proposing having both, and incorporating facilitated small group sessions as part of the program.

> *Run a conference on a theme, like the Water Conference. I got so much out of that. One of the good things was that industry people put on a sideshow as well and that virtually funded the event.*
>
> *I went to one when I was new to the business and got to see the min players. Tat was useful but it was almost a trade show.*
>
> *A lot of engineers are introverted and a big conference is a bit overpowering. It's not the right venue to delve into detail.*
>
> *A group of 12 is about right for a networking session. A big conference is a different kettle of fish.*

4.3 The Tour

4.3.1 Background

Although it is not exclusively for younger, less experienced industry members, the Tour has been promoted as a good opportunity for them to see what is happening outside of their own plants, and to start building their networks. In fact, the 2007 Technology Tour report states that the Tour aims to:

> *take future industry leaders out of the comfort zone of their own plants and expose them to alternative thinking in a range of industries. A secondary purpose is to allow participants to network closely with their peers in a confined environment for an extended period and become aware of other problems and solutions within the meat industry.*

While the 2006 Tour focused on innovations in processing and focused mainly on Victorian sites, in 2007 and 2008, MLA and AMPC requested that the focus be specifically on environmental issues. These 'enviro' tours have involved sites in both Victoria and Southern Queensland.

The cost of the tour to MLA/AMPC ranges from $11,000 to $14,000 per year. (i.e. approximately $1000 per participant for 4-5 days). This covers the coordinator's fees and travel expenses, the cost of the bus, incidentals and final dinner. Processors cover their staff members' travel to and from the starting/finishing point, and accommodation and meals during the tour.

4.3.2 Tour content and design

With the focus of the last 2 years being on environmental issues, the 2007 and 2008 tours have involved site visits focusing on:

- effluent treatment,
- methane capture,
- CO_2 based refrigeration and heat recovery,
- baleen filters,
- alternative fuel use,
- plus a visit to Australia's only 6 green star rated building.

Sites are selected according to the interaction of several criteria:

- Ability to demonstrate an innovation likely to be of interest and value to participants
- Willingness to have visitors on site
- Proximity to other sites to limit travel time
- Rating by participants from previous years

The organisation of the tour is logistically challenging. The facilitator believes it is important to offer 2 or preferably 3 sites per day, and to keep time spent travelling between them to a minimum (even though the time spent on the bus is quality talking time). This places significant limitations on where the Tour can go even before the availability of interesting and relevant plants is taken into account. The last two tours have attempted to broaden the scope by incorporating air travel between Brisbane and Melbourne but this can create its own issues. In 2007, the trip was delayed when Brisbane airport was shut down due to weather.

Another potentially limiting factor can be the facilitator's own knowledge and connections. He can call on connections in some areas in which he has worked, but not in others.

> *When I'm looking for sites, I look at applicants for Innovation Awards, pick the brains of people in MLA, follow up on suggestions from Tour participants, and use my own knowledge, but it can be difficult, especially in areas I don't know so well.*

In selecting topics of interest and relevance to potential participants, the facilitator draws on his knowledge of industry hot topics, seeks input from MLA, AMPC representatives and industry personnel. The location of sites is often a critical factor as he tries to schedule three site visits per day, and to limit travel time between sites as much as possible. This has led to a focus on Victoria, and more recently, southern Queensland.

As it is not possible to visit potential sites prior to designing the tour, he employs a rolling strategy to reduce the risk of a 'poor' site, incorporating a selection of sites that received high ratings from previous participants. Ratings for the same site can occasionally vary considerably (e.g. from 4 to 18 out of 20), and some sites have been rated highly by a number of participants in one year but not in the next. This seems to be influenced largely by the quality of the guide. It appears to be important that the person explaining the innovation be someone who has been closely involved with it. However, this is not always easy to arrange.

> *We got a different response in earlier years when the guy who built the plant showed us through, but this year at the last minute they gave us a different person and he didn't have the background. It just wasn't the same.*

Wherever possible, meat industry sites are supported by experts from their innovation partners, who provide detailed technical information and background on how and why the technology was implemented so that, 'the "Technology Tourists" receive not only a close up look at innovation… but also an in-depth technical explanation of each technology or innovation observed'. (MLA Technology Tour Report 2005). Where there are no specific innovation partners, individual site staff members act as guides and provide technical input. Although it is preferable that the guide has been directly involved development and implementation of the innovation, this is not always possible.

The facilitator reports that participants 'would love to see more of their own industry'. Each year, he tries to book more meat processors but this is 'not always easy', and several have fallen through at the last minute due to internal politics.

> *You might get agreement at production management level but then the CEO stops it. But they don't usually give an outright no so we keep trying the next year!*

It appears to have been easier to gain access to processors in the two years of the Enviro Tour because environmental issues are not seen as 'contentious' and many aspects can be viewed without providing access to other parts of a plant.

4.3.3 Company participation

The tour is designed on the assumption that most participants will only attend once within a space of 5 years, although in fact two people have attended twice.

Since its inception in 2004, 58 staff from 22 meat processing companies in 5 states have been on tour. (See Table 4.5). A number of companies are using the tour on a regular basis, with 9 of the 22 companies (41%) having sent participants more than once. Of these:

- one company has sent participants on four of the five tours
- three companies have participated in three tours
- five companies have participated in two tours.

Although originally an SA/WA tour, the number of companies from other states is increasing, despite limited promotion.

State	Number of companies 2004 - 2005	Participants 2004-2005	Number of companies 2006-08	Participants 2006-08	Total companies 2004-2008	Total participants 2004-2008
Qld	1	1	3	5	3	**6**
NSW	0	0	5	15	5	**15**
Vic	3	5	3	6	5	**11**
WA	5	10	2	3	5	**13**
SA	4	6	2	8	4	**14**
Total	**13**	**22**	**15**	**37**	**22**	**58**

Table 4.5: Tech Tour: Company and Participant Numbers

Although full details of participants' work positions was not available, for the last 2 years the Tour has attracted a diverse clientele, including QA managers, production managers, supervisors and trainers as well as environmental officers and plant engineers. Three quarters of participants have been under the age of 35, supporting anecdotal reports that some companies are using the tour as a training ground for their young supervisors and new managers.

One of the aims of the Tour is to encourage mixing, so numbers have been deliberately limited to a mini bus. The facilitator reports no difficulty in filling the bus each year. Nor does he have to turn anyone away. He does just enough promotion through formal and informal channels to ensure that the bus is filled each year, with seats being reserved for representatives from MLA and AMPC. As this process is in effect self-limiting, it is not possible to ascertain the extent of potential interest/uptake. However, some of the plant engineers in Queensland interviewed for this project had never heard of the Tour, but thought it sounded interesting.

4.3.4 Why do people go?

Only one of those interviewed went specifically because of the content:

> *I've been on the Tour before, but went this time specifically because the program was aligned with the projects I'm involved in.*

In keeping with the more junior positions of most participants, some did not have a choice:

> *My boss told me I had to go- but I enjoyed it.*

Again, networking was an important component, particularly for the more experienced group members.

> *This is the best networking I've been involved in.*

No-one reported finding it difficult to be released, and senior managers did not see it as an overly costly exercise. Holding the tour in the middle of the year has proven to be optimal. It seems to be a reasonable time for participants to be released from their plants. It is also cooler for bus travel and, so far, site visits have not been unduly affected by rain.

4.3.5 Participant perception of usefulness

As with the Network, those who go on the Tour value the experience because it is so practical.

> *It's very hands on. I'm a practical person and I like to see what we're talking about. It makes more sense.*
>
> *It was worth making time to go (even though that is hard!) to see what others are doing.*
>
> *It's a lot easier to see something than read about it.*

One participant felt the highlight was 'the innovation ideas he got from others on the tour'.
Others identified Highlights specific technology or site as highlights, although the ratings sheets suggest that personal interests vary considerably. (And interestingly, there was not always a close alignment between the site an individual selected as a highlight and the rating he or she gave it out of 20).

4.3.6 Appropriateness of current format

A company manger reported that his company sent young supervisors so they could, 'See what's going on in the world. Some have no idea what's outside their own town.'

The Tour appears to be catering for this need, the facilitator reporting that, 'Some of the most positive feedback we get isn't from the experienced engineers, but from the younger QAs, supervisors and environmental officers'. When asked for the highlight of the Tour, one young participant said, 'Seeing other abattoirs'. Another suggested that future tours have 'more meat plants'.

The facilitator observed that there was value in having a mix of people with different levels of experience because:

> *mentoring happens automatically. The older ones are more than happy to talk to the young ones and help them understand what's going on. The bus helps this of course, as they have to talk.*

The mix may create difficulties in terms of the design of the Tour program. Where any abattoir or other type of plant can be an eye opener for a relatively inexperienced participant, highly experienced participants may be looking for something more. As one observed:

> *I didn't think the Tour was showing us anything very leading edge. I got the feeling the program was stuck in a bit of a rut. We went where it was easy rather than to see the best on offer.*

This comment also suggests a need to define – and then to manage - expectations. Is the Tech Tour about exposing industry decision makers to 'leading edge' technology to help them decide if this is appropriate for their context? Is it about seeing practical (but possibly not optimal) solutions to common problems in situ, and hearing about the journey a company took to reach this end point? Is it about exposing young players to other ways of doing things to try and broaden their minds? Can one Tour do all of these things well, or should it become more focused?

The Tour is very informal, with little time allocated to structured discussions of what was seen on site, with most discussion happening between people sitting next to each other on the bus on the

way to the next site, or over dinner. Although it cannot always be organised an industry speaker at the final dinner has received positive feedback, perhaps the most successful being a speaker who focused on the trends and issues that ma face the industry in the next 20 years.

4.3.7 Tour costs

From an MLA/AMPC industry funds perspective, the four day Tour costs about the same as a one day Network meeting (about $1000 per person), even though it covers a much longer period of time. However, it is clearly more expensive from an individual company perspective, given that companies cover the cost of their own staff members' food and accommodation and cover travel expenses to and from the start and finish.

Neither participants nor company executives interviewed expected a measurable financial return on their investment in the Tour. They placed higher value on finding out at least one useful thing, making a good contact, creating a space for some quality thinking time or exposing their younger staff to other ways of doing things.

4.4 Discussion

4.4.1 The Network

Although the Network has been 'national' since 2006, almost all participants are from Queensland and NSW. While the Tour mini bus is filled without a lot of effort on the part of the facilitator, and is starting to attract participants from all over Australia, the Network facilitator has to do a lot of work behind the scenes to keep participants coming. However, the research suggests that this is a characteristic of all industry networks - and despite some concerns about low participant numbers, attendance is on a par with those of the Mintrac-run Network groups.

Participants' perceptions of relevance and value
Those who attend the Network find it valuable, if only for the chance to get away from the busy-ness of their plants in order to mix with like minded people, be kept up to date on information and perhaps to do some quiet thinking without constant interruption.

The Network facilitator goes to some trouble to identify topics/sites that will be of immediate interest to participants. There seems to be a match between the 'smorgasbord' approach and participants' expectations- i.e. they accept that only some things will be relevant and useful, but eel that the day has been worthwhile as long as there is something they want to know about somewhere in the mix. Interestingly, one participant reported that he did his own thinking during presentations that were not relevant to him, and this gave him a chance to reflect on 'Big Picture' issues he couldn't make space to think about at other times. However, the question needs to be asked – even though this is the way it has always been done, does the program have to be so hit and miss? Is there a way of better targeting what people need?

Degree of interaction
It is clear that the network meetings offer one of the only opportunities for plant engineers to get off plant to talk to others and hear about things that could make their jobs easier and/or more effective. The importance of this, particularly for those who describe themselves as 'isolated', should not be underestimated. They are not 'junket' people, so they must feel they have not wasted their time, but it is the networking they value most. However, in the Network meetings, very little time is actually allocated to support either formal or informal interaction with peers, or with presenters through question time or facilitated discussion. While the site visits themselves are ideal for the participant group, who all like to see, rather than just hear about technology,

there would also be potential for some form of discussion to make connections between what has been seen and a participant's own context. While all participants cited networking as a positive outcome, they also wanted more opportunities to interact with each other during meetings, and to discuss information and ideas with each other in more depth.

The extent of Network networking is also limited because there is little continuity of individual participants from one meeting to the next. It is therefore somewhat surprising that interviewees who had only attended one or two meetings still valued the networking opportunity – because it was better than nothing. They had literally lost all other avenues for networking and learning off the job, so although, they felt the current network approach could be improved, they were quick to stress that it served a purpose even as it was. They did not want to see it scrapped.

Degree of participant involvement
It is impossible to gauge the extent to which network presenters take participants' prior knowledge into account. However, in sessions attended by the reviewer, the presenters 'presented' much as they would at a larger forum, without taking advantage of the setting to interact with the small group, and without generally acknowledging or drawing on the experience of audience members. The potential to use the forum for sharing and questioning information and ideas was simply not utilised.

The lean approach has the potential to offer many measurable benefits (as one meat company is already demonstrating), with impacts that go beyond improved maintenance programs and reduced downtime to decreased absenteeism and staff turnover, and improved image in the community. However, for a topic such as this to have any traction with this audience, participants needed an opportunity to talk, argue and question in a facilitated discussion. As it was, it appears that most participants were using the hour and a half as a time to switch off and think about something else!

Impact on action
There does not appear to be a great deal of tangible action precipitated by attendance at a network meeting. Those interviewed said they found it almost impossible to take ideas further once they were back on plant, and few found the time to do further research. If there was follow up it was most likely to be a call about a work related matter made to someone they had met on the day. However, While there is limited evidence of the Network having impact on a participant's behaviour it would be unreasonable to expect this from a one off 'event'. The research into transmission modes of learning suggests that the likelihood of anyone acting on information transmitted in such a forum is between 3 and 9%.

The Network does not currently offer any support for sustained learning over time. Several participants suggested a more structured approach offering subsequent sessions on specific topics, perhaps involving them doing some work back at their own sites in between, and felt this would make a big difference to what they could get out of it.

> *I think we need follow up. I come away with new ideas but back at work it's full on. I start at 5am and I'm flat out until 4 pm at least. I can't do anything about the idea straight away so it sits in the back of my mind until it's gone! You have to create time and space to act or else it's gone from your memory. Maybe send out something about a month after the meeting to keep things fresh.*

Several interviewees suggested introducing what was, in effect, a structured action learning approach.

> *For me what would work is to give me something I have to do with a deadline and I'll do it. Give me some stepping stones to reach and then come back together to talk about it.*

This option also received strong support from others.

From a company perspective, there appears to be little direct impact. However, companies who regularly send participants see the meetings as a way of keeping abreast of what is going on in an industry where people find it difficult to make the time to read newsletters or search the web.

4.4.2 The Tour

The Tour has a regular company clientele. It is never difficult to fill the bus, and participants are generally very positive about the experience. The Tour offers a very low cost form of professional development from an MLA/AMPC perspective, and ongoing support from individual companies is an indication that they believe it to be value for money also.

Target audience and goals
This raises two key questions about the Tour. Who is the intended audience? What is the priority purpose? Although it was not the original intention, it is evolving into a trip for younger industry members, with an aim of introducing them to other plants and other industries as part of their general education. This is now part of the promotional material. However, the Tour itself has not been specifically designed for this, and experienced industry members still attend, with expectations of their own that may not be met. While having them on the trip is potentially of great value to younger members, it will only work well if the experienced player is prepared to act as a mentor, and does not necessarily expect to see state of the art sites and to interact as an expert with other experts. (To their credit, the experts interviewed were happy to take on the elder statesman role, but the point is that this was not necessarily what they had expected, nor was it designed into the program).

Networking
The Tour offers a major networking experience very effectively, with the ongoing interaction that comes from close proximity over several days in a small bus and group interaction at meals. There is however, potential to introduce a little more 'scaffolding' to the discussions without undermining the relaxed nature of the interaction. Again, this could be designed as part of the professional development of younger members of the industry, to help them reflect on the implications of what they have seen, and to stretch them to make connections to their own contexts and identify areas where they want to know more.

Impact on action
As with the Engineering Network, once the tour is over, it is over. While individual participants all feel they have learnt something, and some have felt the experience opened their eyes to the fact that other plants do things differently, it is difficult to identify tangible impacts on participants behaviour or on action back at their plants. Given the fact that most are young, and not in positions of responsibility, this is to be expected. However, there is no formal follow up, no action learning, and no support for individuals who might want to take their interests further.

It is not likely that the Tour is currently having any significant impact on company or industry take up of technology. Tour sites are dictated by the tour theme, by their proximity to each other and by previous ratings. Adopting this approach means that the facilitator can organise each tour very efficiently, and this has kept his fees to a minimum. In the main, it also appears to have

been successful from the participants' point of view. (As many have not been to another meat processor before, they do not have a lot of prior experience to bring!). However, this approach makes it impossible to incorporate innovative sites that are 'off the beaten track'.

Overall, the Tour is an inexpensive activity offering companies excellent value for money. It is well suited to younger participants and could be further structured to help them get more out of the experience without undermining its current strengths.

Tables 4.6 and 4.7 apply the criteria for effective professional development to the Network and Tour.

	Evaluation criteria	Engineering Network	Tech Tour
1	Acknowledges and caters for participants' prior knowledge and interests	Actively seeks input into program design from industry members, participants. Works on the smorgasbord principle- the more varied the options the more chance there will be something for everyone. Limited opportunities to explore connections between information /ideas presented and own context	Actively seeks input from industry members, participants in program design but final decisions strongly influenced by logistics and access. Not clearly focused on issues/themes relevant to participants' contexts. Limited formal opportunities to explore connections between sites and topics and own contexts.
2	Recognises participants' current levels of expertise (from novice to expert)	Does not necessarily cater for different levels of expertise, background knowledge	Loosely targeted at less experienced - offering a general horizon expanding experience with informal mentoring from more experienced May miss the mark/not meet the expectations of experts.
3	Encourages interaction (with peers, presenters and technology) and knowledge sharing amongst peers	Very limited formal or informal interaction opportunities within a session Limited continuity of participants from one meeting to the next, so little potential to build on-going relationships Site visits offer varying degrees of opportunity for hands on practical technology focus.	Extensive informal interactions over an extended time Site visits offer extensive opportunities for technical focus, interaction with other industry members and peers
4	Encourages deep reflection	Too many topics, too much information Little or no discussion time Personal reflection happens during the boring bits!	Limited structured discussion or group exploration of ideas and issues.
5	Involves specialists where appropriate	Emphasis on non-meat processors (especially suppliers) as presenters reduces credibility and impact	Site presentations by Innovation partners involved in site presentations with company representatives adds credibility and potential to learn
6	Offers intense focus on topics sustained over time	One off events with no structures to encourage/facilitate follow up	One off events with no structures to encourage/facilitate follow up
7	Facilitates action learning		

Table 4.6 Encouraging learning: Network and Tour comparison

	Factors affecting network effectiveness	**Optimal conditions**	**The Engineering Network**
	Group size	Small to allow for interaction and the building trust	Appropriate on most occasions
	Group make up	Members should be from organisations of similar size if possible	Not necessarily the case, but has not presented as a problem
	Regularity of meetings	Preferably monthly	Once or twice a year
	Quality and regularity of member participation	Group membership needs to be relatively stable Members need to attend and contribute Members prepared to share stories and ideas, and offer assistance	Very small group of 'regulars' Different participants at each meeting Members prepared to share but not always given the opportunity as part of proceedings
	Level of member interest and commitment	Members need to set and own the agenda Vibrant meetings with momentum maintained throughout by effective facilitation	Members have input into agenda Little active facilitation of proceedings de to focus on lecture style presentations
	Degree of emphasis on member input and interaction	Opportunities to discuss problems/issues with peers who have had similar experiences. No lectures	Very limited programmed opportunities and limited informal interaction due to shortness of breaks etc Mostly lectures
	Degree and nature of 'outside' involvement	Experts may add value but should not dominate Suppliers should not usually be involved as they are likely to inhibit sharing and to be seen as having another agenda	Experts dominate due to structure Strong emphasis on suppliers as presenters
	Quality and nature of facilitation	Facilitator as enabler- • listener not lecturer • effective facilitator of proceedings to keep things on track and maintain momentum • manager of logistics (agenda, field trips, meeting venue etc) • role in ensuring topics remain of interest and in rallying members to attend regularly	Facilitator manages logistics extremely well and ensures that some topics likely to be of interest to each participant Does not lecture or dominate Maintains agenda on the ay with little need to keep discussion on track because there is little discussion

Table 4.7: Evaluating the Engineering Network as a network

4.5 Options for change

4.5.1 The Network

4.5.1.1 New structures

All those who regularly attend the Network report finding it useful. However, most were also interested in ways of enhancing the current approach in some way. Ideas explored and supported included:

- Fewer topics, with time for facilitated discussions after each.
- A two day conference that would attract more participants, involving some longer workshop style sessions with smaller numbers to encourage conversation and questions. Some also suggested having a trade show attached to the conference to provide some hands on style information and help pay for the conference
- Regional meetings following the conference, to allow follow up on key issues identified at the conference. (Interestingly some Qld network attendees found that the side of the river the meeting was held on affected their attendance. If they had to cross the gateway bridge after 4pm they might not get home for 3 hours)
- A theme based approach driven by a 'hot topic', with companies sending a mix of people who needed to be involved (i.e. not necessarily all engineers). This could be run over a year or even two, with 3 or 4 meetings a year. MLA could organise expert input and support to assist companies to take action between sessions.
- Combining the Engineering and Environmental networks or running them back to back

4.5.1.2 Hot topics

Engineers and others on the tour identified the following as areas of particular interests to their plants:

- OH&S and engineering
- Hygiene & sanitation
- How to work more effectively with people, especially with a multi-cultural workforce
- Managing the carbon footprint,
- Carbon trading
- Solar energy
- Methane capture, cogen/energy saving
- Effluent systems
- KDA tariffs
- Basic engineering issues that impact on the bottom line
- Maintenance reporting systems
- Refrigeration
- Conveyancing
- Rendering
- Lean

However, this sort of shopping list does not do justice to the complexity of what they really wanted to know. As one asked,

> *How do we run factories built round coal fired boilers needing so much energy? How have others tackled this? Where are the efficiencies and synergies to burn waste products? We've got old plants, so to change is a big thing. It involves big projects, lots of planning. It helps to draw on real life experiences but you need more than that and you have to stay focused, while you try to work out what's what.*

4.5.1.3 Methodology

Many of those interviewed proposed changes to the format that reflected the findings of the Literature review on effective professional development.

They wanted:

- fewer topics and more time to talk about them,
- an opportunity to share their own experiences and to hear what others had to say
- experts as required but less emphasis on salesmen
- time to reflect on what new information might mean in their own plants
- organised follow up with the possibility of on-going meetings on one area relevant to their situations an assistance from MLA to do some of the research leg work including identifying credible experts in the field

4.5.2 Future Tour options

Ideas for the Tour developed as part of the consultation and focus group processes included:

- Make it a formal Leadership training opportunity aimed at younger members of the industry with potential
- Design a targeted tour, linked to an MLA /AMPC Innovation program. (This would make it easier to identify possible sites and cut down organisation time; companies involved would want to come so there would be no trouble filling the bus and because the focus would be on targeted issues, meat processors might be more inclined to open parts of their plants to outsiders).
- Establish formal links to other to other programs. e.g. make it an option (or even compulsory) for participation in Mintrac's Leadership program or the MLA/AMPC post graduate programs
- Design Tour to support particular modules in the Leadership program or offer it as part of a special module in its own right.

5 Success in Achieving Objectives

5.1 Objective 1

To evaluate the impact of the Engineering Network and Technical Tour on individual participants, their companies and, where possible, on the industry

The study has provided a range of insights into the impact of participation on individuals. However, as the main outcomes of participation were personal networking and general awareness raising there were few identifiable impacts at company level or across the industry. There is little evidence to suggest that either program is acting as a catalyst for change. Most participants acknowledged that even though they intended to follow up on some of the information presented, this seldom occurred due to the pressures of work. In some cases, participants did not have the position power to take an idea forward.

While both programs are relatively inexpensive in terms of industry funding, attendance patterns suggest that non-Qld/NSW companies do not see the Network as worth the travel time and costs. Those companies that do send participants regularly are not usually expecting an obvious 'return', other than networking and information updates.

A small group of companies is using the Tour as a training ground for its younger supervisors and managers, and again, values its horizon expanding properties. However, more experienced participants do not necessarily get as much out of some of the sites visited. F From an industry perspective, there is evidence that the Tour helps to break down barriers between members of competing companies, and that the facilitator has had some limited success in getting plants to open their doors to others, particularly through the environmental focus of the last two years.

5.2 Objective 2

To consider what can be learned from these and other networks in regard to the provision of effective professional development within the industry

An outcome of the study is a set of criteria for evaluating the potential of programs on professional development based on a review of literature, key aspects of which have been validated by those interviewed. The industry programs reviewed have now been in operation for some years, so they provide measurable indicators of participation over time, and data from participants on what facilitates their learning and what does not.

Key findings include:

- the need to recognise the importance of designing meetings, forums and tours from a learning perspective as well as from a content perspective.
- This need to involve facilitators with specific technical knowledge and industry credibility plus skills in the design of programs that facilitate learning. (This may mean using a team approach rather than expecting to find one person who has it all!)
- the psychological value of getting away from on-plant pressures to mix with like minded people
- the importance of creating opportunities for sharing of information and ideas amongst peers, as well as listening to input from external 'experts'

- the well developed reflective skills of experienced plant engineers and the need to structure professional development to allow time for deep reflection
- the appropriateness of action learning approaches for engineers who like to learn by doing and who understand the importance of reflection and redesign.

5.3 Objective 3

To identify alternative approaches that might facilitate the development of the skills and knowledge the industry will need in the next five to ten years.

The study has provided:

- the perspectives of a variety of industry members on the challenges ahead and the critical skills and knowledge required to address them
- a set of guiding principles and goals, and a draft framework to provide a context within which to consider potential strategies
- a range of options for the Engineering Network and Tour, plus links and synergies that could be exploited and new programs that could be introduced.

6 Impact on the Meat and Livestock Industry

While changes to the Engineering Network and Tour should in themselves assist capacity building within the industry, these programs have also been used to highlight more strategic issues. These have been taken into account in design of the draft blueprint for professional development in the red meat industry. This framework offers a context for planning how to ‘ensure that the meat and livestock industry has access to the skills and knowledge it needs to be profitable and sustainable’.

In the short term, it should provide a provocation for further discussion with key stakeholders. In the longer term, a revised version could provide a useful tool for planning, monitoring and evaluating a range of connected strategies for change.

7 Conclusions and Recommendations

7.1 Conclusions

The Engineering Network and Technology Tour have been operating since 2003 and 2004 respectively, catering largely for the needs of plant engineers. Both are well utilised by a small group of companies who regularly send participants. However, while each meets participant needs to some extent, they may be trying to cover too many bases and could be more effective if their priorities were clarified, target groups better defined and a greater focus given to methodologies that encourage learning through exploration of ideas, peer interaction and deep reflection.

It is not clear that either of these programs is currently an effective vehicle for developing the types of new skills industry stakeholders have identified as critical, largely because of the focus on content more than on facilitating learning. However, this could be addressed.

The Engineering Network is valued by a small group of companies and participants who see it as their only opportunity to break the isolation of their roles, network and keep abreast of new technologies and processes. There is a role for such a forum. However, its current one off 'event' style is not conducive to peer interaction and does not allow time for exploration of, and reflection on the information and ideas presented. At the very least, it should be revamped with fewer topics and more facilitated discussion. Current participants would like to see it extended over two days, with the potential for follow up sessions on 'hot' topics, perhaps involving them in some action on plant between meetings. (Such an event may have the added benefit of attracting more interstate participants). Alternatively, they suggested a national two day conference that could precede a series of state/regional meetings, (along the lines of the MINTRAC facilitated QA and Environment Managers' Networks but with 1 day rather than ½ day meetings). A tailored Tech Tour could be offered as part of the package.

Although originally open to anyone, the current Tech Tour is proving to be a cheap and cheerful way of raising younger staff members' industry knowledge and awareness of different types of plant operation. It is also an effective way of forming friendships and building professional networks. It offers good value for money now, but could have a far more powerful impact if it were officially designated a Young Leaders' Tour, with a selection process that encouraged applicants to think about why they wanted to go, and raised the industry status of those who were chosen. A small group of highly experienced industry members could be invited to participate as mentors. This would also offer the potential to develop formal synergies with other industry programs, such as the national Leadership Program, and the post-graduate professional program.

If this occurred, it would not preclude the development of other tours using the current tour as a blueprint. The Tour concept could be utilised to provide practical, hands-on insights into the themes/topics being investigated by existing Networks or new Communities of Practice - for example, an Innovation Tour linked to a relevant Community of Practice, where the sites are selected on the basis of their relevance and demonstration of leading edge practices.

The impact of any tour will be more powerful if it is has clear goals and is tailored to meet the needs the industry and an identified target group. There should also be facilitated activities designed to encourage reflection on the implications of the experience for the participants' own contexts.

A tightened focus, combined with scaffolding to support learning, would mean better immediate value from participation in both the Engineering Network and Tour in terms of developing participant skills and knowledge and building cross-plant links and professional networks. This would also make it easier to develop formal synergies with other industry programs, such as the national Meat Industry Leadership program, and the post-graduate professional program. These programs could be promoted to Tour participants. They could also be used as a recruitment ground for potential Tour participants. It would also increase the potential for exposure to new ideas that lead to a participant taking action on plant.

However, while the Network and Tour could be redesigned to better promote individual learning, they may not be the best means for facilitating company learning. There may be a place for a new kind of support that would encourage companies to seriously consider paradigm shifting, technologically driven innovations. Plant engineers would be part of such a program, but it should not be aimed solely at them. The Greenhouse Challenge Community of Practice has the potential to offer insights into models that will work within the meat industry.

A theme/topic based Community of Practice could facilitate the professional development of members and act as a mechanism to support company innovation. It could involve groups of relevant staff from a small number of committed companies, plus industry representatives and invited experts in the field. The program could be designed to facilitate action learning, with regular meetings and on-plant work in between. Companies could be supported in this through links to Plant Initiated Projects and/or Undergraduate projects. Again, there is potential for a Tour (perhaps including overseas sites) as part of this package. While the Community of Practice might initially involve those already at the leading edge, strategies could be developed to draw in other companies over time.

The study has also highlighted broader professional development issues in the industry, including:

- the importance of creating opportunities for sharing of information and ideas amongst peers, as well as listening to input from external ‘experts’
- the psychological and practical value of getting away from on-plant pressures to mix with like-minded people and establish face to face connections
- the need to recognise the importance of designing meetings, forums and tours from a learning perspective as well as from a content perspective. This may mean involving a team of facilitators who between them have specific technical knowledge, industry credibility and skills in the design of programs that facilitate learning.

While changes to the Engineering Network and Tour should in themselves assist industry capacity building, the review has also contributed to the design of a draft blueprint for professional development in the red meat industry. This framework offers a context for planning how to ‘ensure that the meat and livestock industry has access to the skills and knowledge it needs to be profitable and sustainable’. In the short term, it should provide a provocation for further discussion with key stakeholders. In the longer term, a revised version could provide a useful tool for planning, monitoring and evaluating a range of connected strategies for change.

One key theme of the framework is a coordinated approach to the attraction, retention and development of promising young people. The Tour in particular has the potential to become an important component of a whole of industry approach to leadership development.

Another theme within the framework focuses on the needs of the current workforce. The Engineering Network has been focused largely on long standing members of the industry with

high levels of expertise, and their needs should not be neglected. They too need somewhere to share ideas and reflect on the problems they face. The majority of current participants are practical and highly reflective people with a genuine interest in learning. The Network needs to be designed to support them to learn from each other as well as form 'outsiders'. If it is to build an effective network it will also need to be convened more regularly, and in more locations, to allow non-Queensland engineers to enjoy similar benefits.

7.2 Recommendations

- Finalise the Professional Development Blueprint in consultation with industry stakeholders, and use it to identify priorities for action
- Repackage the Engineering Network as a two day, workshop-style national conference, followed by themed state/regional meetings designed to facilitate deeper exploration of participant identified 'hot topics'.
- Re-badge and redesign the Tech Tour as a Young Leaders' Tour program, linked to the National Leadership program and build in more structured discussion as a key aspect of the experience
- Identify new Tour options e.g. an Innovation Tour as an integral part of the new Communities of Practice, or a tailored tour as part of the new look Engineering Network
- Ensure that all professional development programs, networks and forums involve facilitators with technical skills, industry credibility and skills in facilitating learning
- Gain support from key industry leaders to develop a pilot Community of Practice focused on a key area requiring transformational change.

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9 Appendices

9.1 Appendix 1: Literature review-professional development and networks

Professional development

Developing skills and knowledge
Research shows that the environment within which someone works is likely to have a significant impact on the take-up of professional development opportunities, the application of new skills and learning within an individual's practice, and the degree of innovation that occurs across the organisation. (Hawke 2001, ANTA 2004). Therefore to bring about change, it is not enough to focus on the individual staff member. Effective strategies must be holistic, with professional development as one of a set of integrated strategies to bring about change.

However, individual professional development is still part of the mix. Key messages to be taken into account in this review are discussed below

A definition of 'professional development'
Although the term 'professional development' is still synonymous in some people's minds with attendance at externally delivered conferences, workshops and seminars, we will define it more broadly as, 'any activity that develops an individual's skills, knowledge, expertise and other characteristics'. (Centre for Educational Research and Innovation 1998).

The aim of professional development is to change behaviour. For this to occur, Kirkpatrick (1998) argues that an individual must:

- want to change
- know what to do and how to do it
- work in an appropriate climate, and
- be rewarded, intrinsically or extrinsically.

In evaluating the impact of a professional development program, Kirkpatrick (1998:pp.19-23) identifies four different levels of focus.

Level	Key questions
Reaction	What is a participant's immediate response to a professional development event?
Learning	What new knowledge or skills does a participant now have? Is there an identifiable change in attitude?
Behaviour	How far has behaviour changed in response to this learning?
Results	What is the evidence of impact on the organisation's business?

Evaluation of Professional Development (Kirkpatrick 1988)

What makes professional development programs effective?
Many researchers (Ferry & Ross Gordon 1998, Maldonado 2002, Smith et al 2003, Cranton & King 2003, Poell 2004) have identified factors that facilitate learning and behaviour change (Levels 2 and 3 of Kirkpatrick's model). And they all say the same things - that the most effective professional development approaches are likely to:

- be interactive, sustained and intensive,

- incorporate action learning.
- acknowledge and actively draw on a participant's current expertise
- encourage inquiry into existing beliefs, assumptions and specific practices.
- facilitate sharing of knowledge by peers
- involve specialists where appropriate

The need for reflection
Schon (11983) and others (e.g. Daley 2001) have found that incorporating new knowledge is not a simple, straightforward transfer of information from one context to another. New knowledge only became meaningful when participants in professional development programs found a way to link it to their practice. What people felt they had learnt often changed after it was put into practice, and that this could have a profound impact on how they organised and thought about their work. Significantly, this was only likely to happen when new approaches were put into action, and when the people involved reflected on what had happened.

The research consistently shows that it is the quality of reflection that makes the difference. Butler (1996) argues that there is little evidence that a person's practice is much influenced by the *public knowledge* that is transmitted through papers, manuals, professional development workshops and quality assurance processes. He suggests that what someone does is based on their store of lived experience, or *personal practical knowledge (PPK).* This in turn is influenced by a person's values, beliefs and assumptions. The strongest determinant of what a person will do tomorrow is what they did yesterday, and the day before and the day before… To change behaviour, an individual must challenge their PPK and values, beliefs and assumptions, but this has little chance of occurring unless the individual has an opportunity to reflect, revisit, reframe and ultimately to decide to change what he or she does.

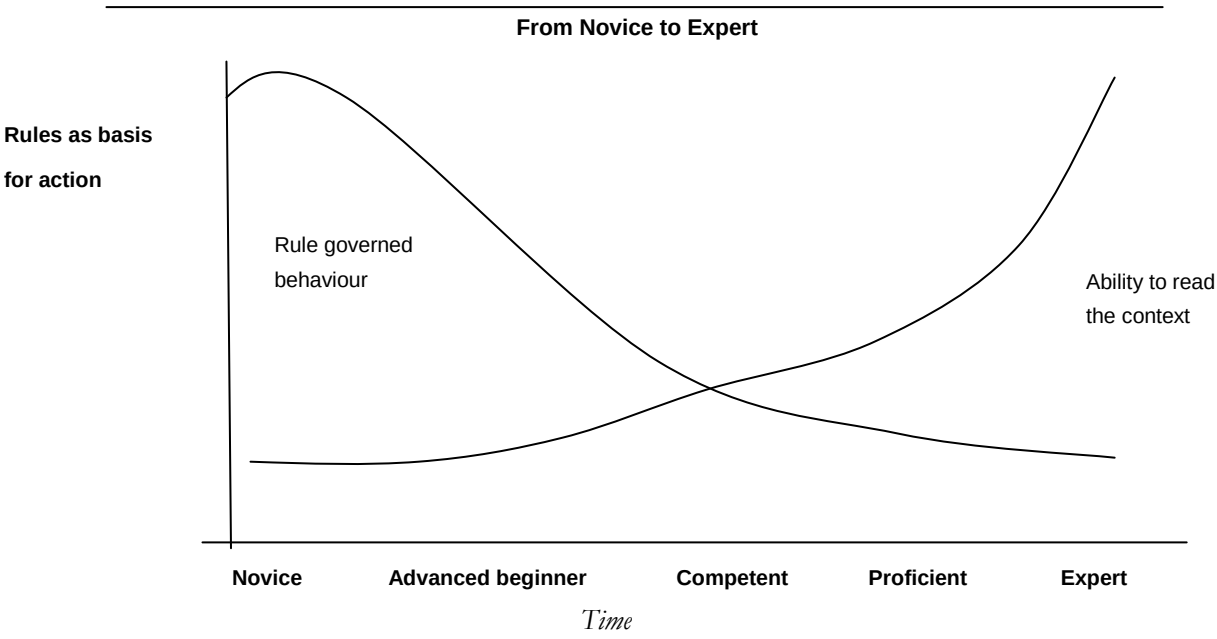
Action learning offers a practical, systematic way of encouraging reflection and group interaction while managing a new idea through from concept to reality. Dick (1997) defines action learning as, 'a process in which a group of people come together more or less regularly to help each other to learn from their experiences'. The critical element is the adoption of a systematic approach to trying something, collecting data about what happens, reflecting on what has happened and using the learning to change subsequent action to continually improve practice.

From novice to expert: the need for different learning experiences
It is also important to take into account the level of experience of the learner/participant in the design of any formal professional development program.

In any job, a person moves through stages, beginning as a *novice,* and moving to *advanced beginner*, *competent, proficient* and finally *expert*.

- *Novices* and *advanced beginners* need clear, consistent rules to direct their behaviour. They need to know exactly what to do, step by step because they are dangerous!
- With practice and support, they reach the *competent* stage, which means they have internalised the rules and know how to operate effectively within them. They have learnt how to plan and organise activities, and feel able to cope with unpredictable situations by working out how to apply the rule. It is important to note that this usually takes several years.
- *Proficient* performers have moved beyond this, and can deal with most exceptions to the rule, but they still need to check in with someone every so often to affirm that they are doing the right thing
- Experts know when to break the rules and when they must never be broken! An expert can read the context, take in a lot of information /factors and can work out what is most

important. An expert seems to instinctively know what to do in any situation, and has the expertise to perform at a high level. However, a real expert also knows what he or she doesn't now and is always interested in learning more.



From novice to expert (Dreyfus and Dreyfus 1985)

The research on this model in many different job roles shows that:

- there are major differences in our need for rules at each stage on the continuum
- expertise depends on the context. We can be an expert in one area, competent in another and a novice in another
- a competent person is defined as one who knows the rules and can be trusted to follow them
- not everyone moves through all stages many people reach the *competent* stage and move no further unless given the right kinds of support
- we become temporarily deskilled when we move to a new context, (for example, if an expert mechanic becomes a plant manager he will be a novice as a manager).
- moving along the continuum takes time. Individuals need the opportunity to try things in practice, appropriate support and reflection.
- competent people are the best people to teach novices. Experts are the best people to teach competent people

The implications for professional development in the meat industry

- the need for a high degree of support for novices, even if they are experts in another field
- the need to challenge the assumption that someone with many years' experience has necessarily developed a high degree of expertise
- the importance of providing appropriate supports for competent practitioners to move along the continuum
- the importance of promoting reflective practice for all

- the choice of professional development methodology, content, facilitator and mentor for people at different stages of their professional journey.

Networks and Communities of Practice (CoP)

Networks and Communities of Practice are two of the mechanisms that can facilitate professional learning**.** They may be formal or informal.

A CoP is defined as a joint enterprise understood and continually renegotiated by its members, who are bound together by engagement in an area of mutual concern. (from Wegner 1998, pp2-4).

> The concept of a **community of practice** (often abbreviated as CoP) refers to the process of social learning that occurs when people who have a common interest in some subject or problem collaborate over an extended period to share ideas, find solutions, and build innovations. It refers as well to the stable group that is formed from such regular interactions…
>
> More recently, Communities of Practice have become associated with knowledge management as people have begun to see them as ways of developing social capital, nurturing new knowledge, stimulating innovation, or sharing existing tacit knowledge within an organization. It is now an accepted part of organizational development (OD).
>
> Source: http://en.wikipedia.org/wiki/Community_of_Practice (Bury, 2007 b)

This, a CoP has a specific focus for learning, and people come together because they are interested in that focus. As they meet over time, they build strong relationships, based on trust and respect. A network on the other hand is established to build relationships (for example between engineers in the meat industry). Focus topics are a secondary (although still important) consideration, providing a vehicle for the building of mutual interest, trust and respect. It is easy to see why there can be a fine line between the two, and why the terms are often used interchangeably.

A study of technology transfer through networking groups amongst manufacturing companies in Missouri (Amos & Tubbs 2001, pp1-2) found that the groups which began simply as forums for exchanging ideas grew into more sophisticated entities and that the topics, ideas and practices were increasingly taken back to individual organisations and applied.

They found that the sharing of ideas was an important part of the problem solving process, and that working with others was a ‘powerful and meaningful’ problem solving tool in its own right. Sharing technical knowledge and personal opinions helped reduce the stress involved in making decisions. Obtaining ideas from others was especially important for managers who were operating alone in their own organisations as they did not ordinarily have the opportunity to seek advice from others and usually [felt] very alone’.

Factors affecting the success of a network:

- The size of the group-keep the numbers low to establish and maintain trust
- The make up of the group- members preferably from firms of similar size
- A strong commitment between members based on a degree of trust and respect
- Regular meetings (preferably monthly if interest is to be maintained)
- Regular attendance and active involvement by individual participants

- Positive interaction, with meetings moving forward ‘ in an upbeat fashion’
- The opportunity to discuss problems with network members with similar experiences
- Participants setting the agenda and deciding on what topics are of importance to them
- Participants being prepared to tell their stories and share their ideas.
- Inviting an expert to join the discussion or arranging a field trip to enrich activities
- The effectiveness of the facilitator

The greatest challenges for the facilitator are in maintaining strong participant interest in the topi(s) and commitment to the group and in ensuring that participants feel they are providing and obtaining valuable information. This means being a good listener and elicitor. The facilitator also needs to manage logistics so that the busy network members do not have to.

It is essential not to lecture network members. ‘Network members want to talk and interact; this is what makes networks more meaningful than having a large conference or seminar.’ (ibid)
While service providers may wish to gain access to the group, Amos and Tubb suggest that this is not a good idea because it detracts from the purpose of the network as a problem solving group, and because the presence of outsiders tends to discourage members from speaking openly about their concerns. (ibid p4)

9.2 Appendix 2: Industry trends and challenges

The following key issues were identified through consultation with key stakeholders within the industry. Subsequently, plant engineers also raised many of these as critical issues in their companies.

1. Labour supply
Attracting and retaining people in the industry has been an issue for many years, and this is predicted to continue. In the past, the focus has been more on attracting unskilled labour and providing appropriate training to develop skilled process workers, there is now an increasing realisation that the industry needs to attract graduates in a range of fields, and to get better at identifying and developing its internal talent, for example by offering technical and university training to process workers with the interest and potential.

Companies and industry peak bodies are addressing labour/skills issues on a number of fronts e.g.

- Employment of overseas workers
- Development of scholarship programs for school/university students and process workers
- Undergraduate and post-graduate programs within individual companies and through MLA
- Increasing emphasis on automation, including a focus on the use of robots
- Redesigning processing plants and work processes to make them more worker friendly

2. Environment
The state of the environment is a major global issue, with community and government expectations reflected in increasing regulation, supply chain expectations, the increasing influence of green groups and increasingly informed (and some might argue misinformed) consumers. This is driving increasing attention to ways of reducing the use of water and fossil fuels and reducing carbon emissions and waste generally. It also highlights issues about the best use of land that are closely linked to questions about the 'best' kinds of food, food miles etc. Several company owners/senior managers talked of over regulation. As one observed, 'We're looking after the rest of the world but it's killing us. It's adding costs, but not value."

3 Perceptions of red meat
There are indications of a rejection of red meat by some consumers on one or more grounds, including the perception that eating a lot of red meat is not healthy, or that eating any red meat is bad for your health, animal welfare issues and environmental issues around cows and green house gas production, and questions about where society wants to get best value from its resources.

4 Food quality and safety
For those who do eat read meat particularly overseas consumers, recent health scares have increased the emphasis on monitoring and guaranteeing food safety as well as quality from paddock to plate. Quality assurance requirements will continue to loom large for both export and domestic processors, and impact on everything from branding to traceability systems.

5 Industry structures
While it appeared that the trend for companies to develop a fully integrated supply chain may be over, indications were that arrangements with external suppliers and customers may be increasingly managed through supply chain assurance schemes. If this follows overseas trends, it would mean increasing influence on meat company internal processes by domestic supermarkets and international buyers. Although those interviewed felt it was too early to call, they wondered if recent changes to company ownership might affect decision making across the industry as a whole, including decisions made by peak bodies in regard to priorities.

9.3 Appendix 3: What should networks be aiming to achieve? Possible goals

Initial consultations identified a range of possible goals relevant to all or some of the networks. e.g.

- To help participants do their jobs better
    - in order to increase efficiency
    - In order to be quicker, smarter
- To give participants dignity and pride
- To develop camaraderie
- To create forums for regulators/industry to have off the record discussions
- To create forums for QA managers to talk /share with each other
- To establish formal links between peak bodies and participants
- To drive professional development for participants (within and through follow up)
- To ensure alignment in language/information/messages
- To increase profile of QA etc
    - in order to develop career paths
    - in order to feel valued
- to show owners/CEOs that industry $$ well spent
- to facilitate collaboration between plants