

EIDA REPORT ON REGISTRATION OF ENGINEERS IN SOUTH AUSTRALIA

A SUBMISSION TO THE DEPARTMENT OF CONSUMER AND BUSINESS
AFFAIRS

1 EIDA REPORT ON REGISTRATION OF ENGINEERS IN SOUTH AUSTRALIA

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1.2 GLOSSARY

QLD PE Act	<i>The Professional Engineers Act 2002 of Queensland</i>
VIC PE Act	Professional Engineers Registration Act 2019 of Victoria
NSW D&B Act	Design and Building Practitioners Act 2020

2 INTRODUCTION AND SUMMARY

2.1 EIDA AND THE INDUSTRY

EIDA was invited by Hon Andrea Michaels MP, Minister for Consumer and Business Affairs to comment on the “Registration of Engineers Discussion Paper”. This report is the submission of EIDA.

Electronics Industry Development Adelaide is an association of companies and professionals in the South Australian Electronics Industry. The last survey of the electronics industry in South Australia was that it has 11,000 employees. It is a high value manufacturing industry that generates substantial revenue for the state.

The local electronics industry mostly produces specialized equipment and services and includes companies like Codan, Minelab and Redarc. But there are many other companies that are hidden because their products are so specialized whether it be atmospheric radar systems, X-Ray equipment, Semiconductor design, and of course defense.

It should be said that most products which may be described as electronic require significant amounts of engineering in fields other than electrical engineering. Further electronics enables many products and services that are not seen as electronic as finished items such as air conditioners and cars.

The local electronics industry is advanced manufacturing operating in a high-cost environment that competes by virtue of its intellectual property. It is the generation of this vitally enabling intellectual property that falls within the scope of the Registration of Engineers Discussion Paper

2.2 THE DOWNSIDE

The proposed Engineering Registration scheme is not fit for broad application beyond the construction sector. The impact of legislating and enforcing the legislation would profoundly adversely impact the local manufacturing, space and defense sectors. Even if the system is legislated but not enforced it will deter investment and increase uncertainty.

The scheme would

1. **Make South Australia less competitive** due to increased costs based on compliance and the time required to complete compliance matters. Registration costs for those without an accelerated pathway is thousands of dollars (essentially the same process as getting recognition for migration).
2. **Make South Australia less competitive** due to companies not being able to manage competency and quality in ways that are optimal for their circumstances.
3. **Make South Australia less innovative** due to reducing diversity and specialist skills in the workforce.
4. **Damage investment in South Australia** due to the increased challenges to recruit specialist skills and the requirement that staff in the investing country will need registration in South Australia.
5. **Cause older staff to leave the workforce** as many competent, especially older employees would be forced from the industry by the difficulty in registering.
6. **Reduce employment opportunities for graduates** due to the requirement that they be supervised for 5 years even if they are not undertaking work of particular risk.
7. **Make the skills shortage worse** for the reasons given above.
8. **Not Necessarily improve competency** in the broader engineering sector.

The above issues are substantially resolved by limiting the scheme as per Recommendation – 1 Scope. This would bring the scheme in line with NSW.

2.3 THE OPPORTUNITY

A carefully designed system may be possible that would reduce the adverse impacts described above but a clear case has not been made for the benefit it would provide outside of some areas of the construction industry.

If a broad system is to be devised it needs

1. **Be able to demonstrate** effectiveness by producing the intended benefits of improved public outcomes and industry outcomes.
2. **A substantial commitment of funds** – the scheme may never be self-supporting and the cost to develop it would need to be invested initially to get through the design phase. A comparable size regulatory body is APHRA in the health industry.

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3. **To engage with all impacted industries and sectors** and not be dominated by the entities expecting to be the Assessment Entities.
 4. **Have sufficiently time** for consultation and a phase in.
 5. **Be national** to reduce costs as Australia is already a small population to support such an overhead. A national scheme will also reduce issues working across states.
 6. **Be well designed** to improve public outcomes and industry outcomes.
 7. **To address the Issues and Recommendations** contained in this report.
 8. **Be compared to other methods** of improved public outcomes and industry outcomes.

2.4 THE ALTERNATIVE

Protection of specific titles such as “Professional Engineer” or “Chartered Engineer” can be protected but not compulsory. That way consumers (mostly businesses) can make their own decisions that are suitable to their situation.

2.5 EXPERIENCE IN OTHER JURISDICTIONS

The proposal is presented as a natural progression that follows on from the introduction of similar systems that are already operating in other states. But this is not the case. Schemes have only been operating in other states in the construction sector.

Queensland has had the QLD PE Act since 2002 which could be a broad ranging scheme but it is not. The Board has only brought cases in relation to construction works. There is a perception among industry outside some regulated areas that the scheme does not apply them. And in practice that has been true – uptake in manufacturing is very low if at all.

The QLD PE Act has been used in civil matters. If a protagonist can demonstrate a noncompliance with registration requirements and even though the work was performed competently – they do not need to pay for it. In one case the court found that even though the wiring work was done by certified electricians as by convention, the work fell into the area of a professional registered engineer.

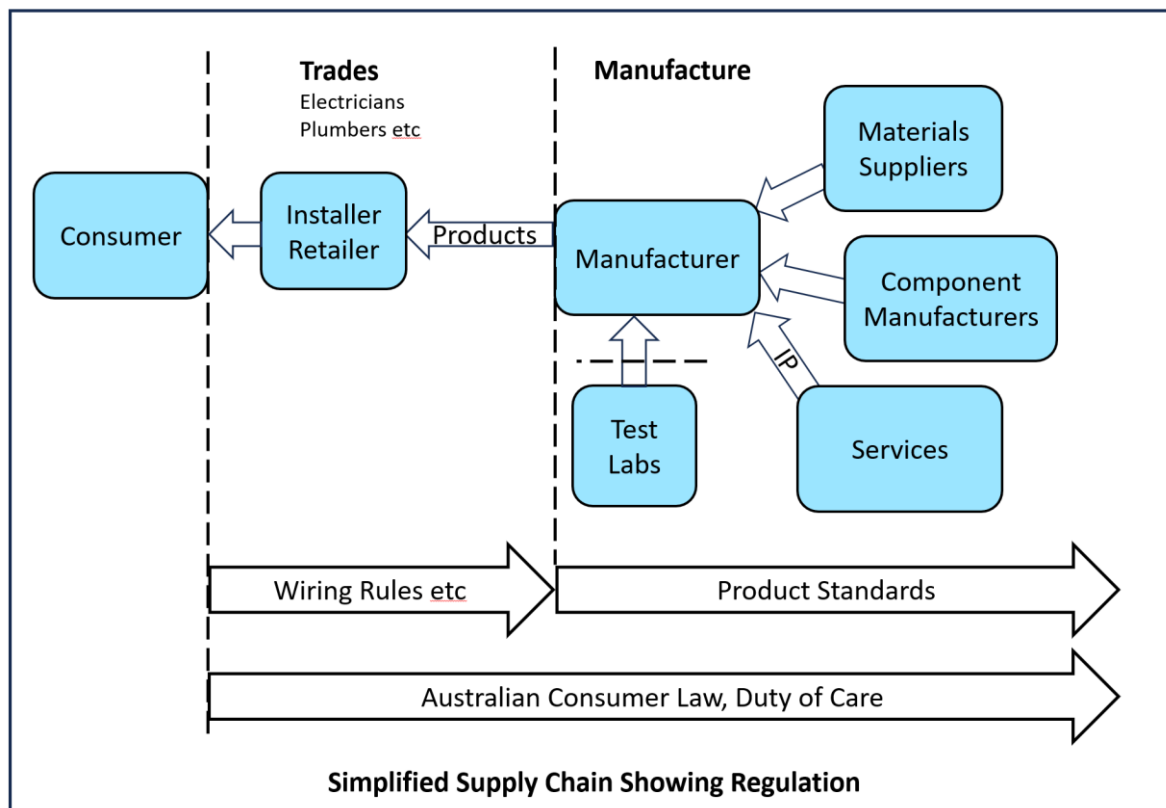
The VIC PE Act has been rolled out beyond construction but these rollouts are still not complete so it is still too soon to see the effect of this.

The NSW D&B Act is, at least by regulation, constrained to a sub section of the construction industry.

Australia does not have experience of a broad-based engineer registration scheme.

3 MANUFACTURING SUPPLY CHAIN

An appreciation of the product supply chain and how confidence in the quality of its outputs are controlled is essential to the understanding this report. A simplified view of the supply chain is shown below



The diagram above shows a Consumer on the left which may be a business or an individual. The products may be finished goods or components. These may be simply taken home and used or they may be installed by an electrician or plumber for example. Engineering methods are applied throughout the supply chain. For example, an electrical appliance will have many components that were required to be designed. Further in the manufacture of the appliance other machines will be designed to produce and test the product. This engineering will be performed by a mix of employees, companies providing engineering services and companies providing products that embed up stream engineering in their product and services. The consumer has purchased a product that embeds a substantial amount of engineering but it could not be said that he engaged an engineer when he purchased a blender.

A multitude of engineering services go into producing a product but it could not be said that the consumer buying a product has engaged an engineer.

Quality in the outputs of the supply chain for consumers goods and others are regulated by product standards. These standards are overwhelmingly concerned with the output of the supply chain rather than the method of design (which is buried in a complex web of upstream suppliers). Manufacturers generally need to engage a certified laboratory to verify compliance. The product standards are mostly international standards, sometimes with specific adaptations for Australia. It is important to note that these same standards apply to imported products and that many Australian manufacturers will be complying with product standards of other countries in order to export.

Sometimes a consumer of a product will be an expert consumer – nearly always business. In this case the consumer will negotiate the quality and how it is established with the provider. This might be the case for a manufacturer that orders the design of a new product ad component and samples. It may be the customer wants a design so that they can verify the suitability for an application or subject it to testing.

Product Standards protect consumers who are not expert consumers. Expert consumers negotiate quality controls to suit their purpose.

4 ISSUES AND RECOMMENDATIONS

4.1 SCOPE OF PRACTICE

The report states that it is intended that it only cover engineers providing services related to construction work but the scheme is likely to be extended to cover other fields of engineering. There are at least three aspects of scope. The first is engineering field (ie Electrical/ Mechanical/ Civil etc). A second aspect could be the application of the engineering service – for example the construction or automotive. A third aspect is the location in the supply chain relative to the end user. For example, a plumber is licensed to install a tap but a different skill set is required to design a tap.

This limited approach has been taken by regulation in the NSW D&B Act. Looking at the regulations applying to this act it can be seen the complexity of adjusting qualifications to make them relevant to different fields and industry. Each additional field would need to be carefully designed if it were to provide a benefit without unintended consequences.

4.1.1 RECOMMENDATION 1 – SCOPE

The legislation be limited to only those areas where a problem has been identified and after consultation with the industry and consumers registration is the best solution.

4.1.2 RECOMMENDATION 2 - SCOPE

If a broader scope of practice (industries) is to be included then it should exclude engineering services in industries and work related to product-based supply, manufacturing and defense.

4.2 GEOGRAPHICAL SCOPE

The discussion paper has the scope listed as

Registration would apply to engineers who reside in South Australia and are providing services for a South Australian project or a project in another state or territory. Engineers residing outside South Australia would also need to register where providing services for a South Australian project

This scope presents substantial issues. For example, if the SAPOL orders 5 modified pursuit cars from BMW for its anti-hoon project then each and every engineer in Germany and through the BMW supply chain involved in the design of the BMW would need to be registered in South Australia or supervised by a Registered Engineer. Consumer and Business Affairs Victoria issued a practice note to say that 'generic' products made outside Victoria were excluded. So that exclusion (not broached in the discussion paper) may address the issue of the BMW base car but any engineering done to customize the cars would require the BMW staff to be registered in South Australia.

Some strategy has to be adopted to prevent imported products from being included. The end result is that the additional cost is carried by local companies that interstate or overseas companies do not have. Even if the registration scheme would provide a benefit, the public would not get that benefit in respect of imported products.

It seems clear that the geographical scope definition is based on construction projects and is not suitable for extension to other fields.

4.2.1 ISSUE – GEOGRAPHIC DISADVANTAGE

The geographical scope, as proposed cannot work. Attempts to fix the geographical scope issue would put local industry at a disadvantage.

4.3 DEFINITION

The Discussion Paper refers to Engineers and Engineering Services. The problem with this is that no attempt to define what an engineering service is. The definitions used in Queensland and Victoria both state that for a service to be a professional engineering service it must first be an engineering service and further restricts it. But there is no description of an engineering service.

professional engineering service means an engineering service that requires, or is based on, the application of engineering principles and data—

(a) to a design relating to engineering; or

(b) to a construction, production, operation or maintenance activity relating to engineering—

other than an engineering service that is provided only in accordance with a prescriptive standard;

It would seem that the exception for prescriptive standard is an attempt to ensure the legislation does not include those traditionally employed in the trades such as electricians. However, in the case of Agripower Australia Ltd v Queensland Engineering & Electrical Pty Ltd the presiding officer ruled that AS3000 could not be considered a prescriptive standard because it had at least one aspect that provided scope for discretion. As a result, even without any fault identified the payment for the work has to be returned.

Simply because it was not the intention to include the trades in the legislation does not mean they are excluded. Essentially all trade work would need to be supervised by a registered engineer unless it was completed to prescriptive standard. Quite apart from this not being practical it does not necessarily add to the safety or quality of the trade work. The skill sets are quite different.

It is not possible to separate work between trade and professional sufficiently clearly across all fields and applications of engineering. In failing to do so the relevant industries cannot operate and be compliant.

4.3.1 RECOMMENDATION 3 – DEFINITION OF ENGINEERS SERVICE

An engineering service is defined by regulation as a specific activity such as performing an inspection to a particular standard or completing a mandated document. Those activities and forms to be added by specific inclusion.

4.4 DEMARCATION

It may seem convenient to think of all engineering services falling clearly into one field or another. But the truth is that an electrical engineer will apply mechanical principles and vice versa. The proposal suggests that this is not possible with multiple registrations. In practice, even with professional engineering registration, engineers assess their own competence within their field of expertise in relation to a particular job. An electrical engineer that has spent their career on semiconductor design won't be walking in to take over a half-finished substation development even though their professional registration may allow it. On the other hand, an Electrical engineer designing a module should not be restricted from doing bend analysis for an electronics module. In making this decision the practitioner will consider their competence and also the consequences and risks associated with it.

Many engineering degrees anticipate this. Mechanical and Electrical degrees often have content on material engineering and electrical degrees have historically included simple static and dynamic mechanics.

4.4.1 RECOMMENDATION 4 – DEMARCATION

The legislation should not restrict providing engineering services that include work from other engineering fields.

4.5 ASSESSMENT – CRITERIA

The first issue for assessment criteria is that what constitutes required skills depends on the work being done. The Electrical engineer with 30 years' experience in undersea power cables may not be competent to design semiconductors but these are both in the same field of engineering electrical. In the case that Recommendation 1 - Scope is adopted (only applying to specific activities) the criteria can be clear and include items like training to national construction codes.

The next issue is about developing a criteria that excludes those that should be excluded in the public interest but does not exclude those competent – and in particular those with specialized skills needed in advanced manufacturing. This is particularly problematic for older staff and those working part time where the effort and cost may favor early retirement. It is also problematic for emerging fields such as renewable energy.

Applying a test like Washington Accord will exclude or make very difficult those specialists that may have other educational pathways such as degrees in physics, degrees from before the Washington Accord (1989) and degrees from non-Washington Accord countries. Even if an equivalence model is taken, the only body in Australia authorized to do this is Engineers Australia. It would make the scheme wholly dependent on Engineers Australia being available and willing to do this at a reasonable price. Currently for a nonmember of Engineers Australia without a Washington Accord degree the costs are about \$3000 to prepare a submission for assessment, \$600 for an assessment, and \$600 to lodge the assessment and it would typically take months.

While the ambitions of the Washington Accord may be noble it is worth noting that countries that are considered strong in engineering are not signatories. For example, Germany, Austria, Czech Republic, Slovenia, Switzerland, (Northern) Italy, France, (Northern) Spain, Netherland, Denmark, Norway, Sweden, Finland, and Estonia.

The South Australian Government should not hitch its hook exclusively onto the Washington Accord. If other schemes show effectiveness, they should not be excluded. In fact, there is no reason to consider the Washington Accord as a benchmark given that mobility of employees and that the legislation has extra territorial application where other standards apply.

4.5.1 RECOMMENDATION 5 – WASHINGTON ACCORD

The Washington Accord should not be adopted as the only criteria. Washington Accord should not be specifically included in the legislation.

4.5.2 RECOMMENDATION 6 – COST

A cost-effective pathway is needed for non-members of professional bodies. The cost for non-members should be no higher than for members.

4.5.3 RECOMMENDATION 7 – COMPETENCE BASED PATH

A scheme must allow registration by demonstrating competence regardless of education history.

4.6 CONTINUING PROFESSIONAL DEVELOPMENT

Most professional accreditation schemes require an ongoing learning aspect CPD. If this is to add value then practitioners need to engage in programs that are relevant to them – given the highly specialized nature for many practitioners the courses should not require local accreditation. By way of example a society of IEEE may have thousands of members around the world but only a few in Australia. The programs that they run are not available locally and their market in Australia is too small to warrant applying for accreditation with an Australian assessment entity. If these are not counted towards CPD it means those in specialist areas have to do two lots of CPD – their own and that required to maintain registration which may be irrelevant to them.

4.6.1 RECOMMENDATION 8 – CPD ACCREDITATION

Do not limit CPD to accredited courses. Simply have criteria for the courses.

4.6.2 RECOMMENDATION 9 – CPD ACCREDITING ENTITIES

If CPD must be accredited do not limit the accrediting entities to offer courses.

4.7 GRANDFATHERING

The various state acts and their regulations had provisions around grandfathering (different requirements for existing practitioners). These provisions were very specific to the scope of application of the acts at the time. Without suitable grandfathering provisions the industry will lose a wealth of talent – it will be predominantly talented specialists that are impacted. To be clear grandfathering needs to be applied over many years.

While there are competency-based assessments they are extremely difficult to access and expensive. This cost and difficulty are likely to push highly skilled people from the workforce. The impact is disproportionately felt by older employees.

4.7.1 RECOMMENDATION 10 – GRANDFATHERING PROVISIONS

Any scheme must provide for grandfathering and such scheme must cater for the vast diversity of specialization within the scope of the legislation.

4.7.2 RECOMMENDATION 11 – GRANDFATHERING COSTS

Assessment Schemes should only be approved where they include a facility to access Grandfathering provisions at the same cost as the lowest cost of any other pathway.

4.8 ASSESSMENT SCHEMES AND ENTITIES

It is plain, especially if Recommendation 1 – Scope is not adopted, that the whole of industry relies on there being functional and competent Assessment Entities that are able to complete assessments quickly and fairly. It is unreasonable to place the ongoing viability of industry in the hands of one vendor (or substantially one vendor). To do so is to make the supply chain more fragile and remove debate and competition from the process.

Further it is plainly clear that by far the largest assessment entity is Engineer Australia. Engineers Australia are also the only entity in Australia that can accredit educational institutions to the Washington Accord or assess some one's skills as being equivalent to the accord. This lack of diversity is likely to stifle debate on registration schemes. If a person's career is in the hands of an association, they are unlikely to speak out against it.

Taking for example the case of Engineers Australia, it's members may simply vote to not continue assessments. It has been a point of contention on and off over a long period of time. If that were to occur there would not be the resources to provide the required assessments and the requirements of the QLD PE Act and VIC PE Act would prohibit a new entity being created to fulfill that role as a newly created entity fails to meet the legislated requirement of demonstrated experience.

Currently the legislation does not require that the assessment schemes are made public. In order for confidence to be maintained the schemes need to be published.

4.8.1 RECOMMENDATION 12 – ACCREDITING ENTITIES MARKET LIMIT

Devise a system such that an accrediting entity does not exceed 40% of registrations within any engineering field

4.8.2 RECOMMENDATION 13 – PUBLICATION OF ASSESSMENT SCHEMES

For any approval or alteration or cancellation of an Assessment Scheme the entirety of the Assessment Scheme should be published publicly.

The QLD PE Act and VIC PE Act are very prescriptive in the requirements for assessment entities. In particular they require that the entity has experience in assessments. This would prohibit new entrants to the market. This is very limiting. For example, the Universities are well placed to offer a part time course that brings people up to date on practices and assesses competence (after all they assess student competence all the time). They should not be excluded.

4.8.3 RECOMMENDATION 14 – REDUCE BARRIERS TO NEW ASSESSING ENTITIES

The legislation should not limit those that can be Assessing entities in such a way as to deter new entrants to the market.

Assessment schemes generally require the production of a narrative about work experience. This can be problematic for those in areas of defense and even for others that are bound by non-disclosure agreements. This is hard to manage. Simply carving out Defense from the Registration requirements would then create a situation where those practitioners who have gained experience in defense are excluded from working in other areas.

4.8.4 RECOMMENDATION 15 – SECRECY IN REGISTRATION

A method is developed so that the ability to register should not be limited by national security requirements or client confidentiality.

The proposal talks about public confidence in the scheme. Currently bodies are offering “Credentialling Programs” that are sold to employers as resolving their engineering registration requirements. Given the complexity introduced by the system this seems reasonable. And it highlights the additional cost. However, it is not reasonable that these credentialling programs are run by Assessment Entities – it places them in a conflicted position. The public already question the integrity of a scheme where members of some associations can simply log in and download their assessment free of charge. With the entities offering combined credentialling and assessments it appears that companies that pay a fee have the issue go away. Regardless of what integrity may be present the appearance undermines the scheme.

4.8.5 RECOMMENDATION 16 – ASSESSMENT ENTITIES NOT TO PROVIDE CREDENTIALLING

The provision of Credentialling Services should exclude a body from being an Assessment Entity.