



TRANSPOWER

Keeping the energy flowing

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BY EMAIL: building@mbie.govt.nz

To whom it may concern

Re: Submission on the proposed occupational regulatory regime for engineers.

Thank you for the opportunity to provide feedback on the Ministry of Business, Innovation and Employment's (MBIE) proposal for occupational regulation of engineers.

The professional and ethical application of engineering knowledge by suitably trained and experienced professionals is critically important to the safe delivery of the services Transpower and other industry participants provide to electricity consumers and the public at large.

SUBMISSION OVERVIEW

Our submission provides:

- a summary of who Transpower is and what we do
- a commentary on MBIE's objective
- a high-level summary of the regulatory context and background that Transpower works within
- a general commentary on the proposal, the issues at hand and the benefits and limitations of regulation and licencing
- responses to each of the specific questions in the consultation questions.

Transpower: who we are and what we do

Transpower is the owner and operator of New Zealand's high voltage electricity transmission system, the national grid (the grid), that connects sources of generation to cities and towns across the country. The High Voltage Alternating Current (HVAC) grid consists of more than 11,000km of transmission lines, and 173 substations and operates at voltages of 220kV to 33kV. We own and operate the 350 kV High Voltage Direct Current (HVDC) link which runs from Benmore in the south, across Cook Strait, to Haywards in the north. Approximately 20% of our 850-person work force have formal engineering qualifications. Engineering skills are used to investigate, design, supervise the construction and maintenance of the grid, to operate it in real time and manage the assets over their

lifecycle of up to 80 years. To deliver a reliable and safe electricity transmission service and run the power system in real time Transpower relies on the expertise of many different engineering disciplines. These disciplines include but are not limited to electrical, mechanical, structural, civil, geotechnical, power systems, control, automation and protection, communications and networking. Our annual spend on specialist professional engineering services is approximately \$45m with consulting companies such as BECA, Aurecon, AECOM, and Mitton Electronet. Our contracted service providers, which construct and maintain our assets, have a workforce comprising of Engineers, Engineering Technicians, and Engineering Technologists.

MBIE's objective

We understand that MBIE's primary objective when designing an occupational regulatory regime for engineers is to give people confidence in the engineering profession and the engineering works undertaken by engineers, by ensuring:

- regulation is proportionate to the risks to public safety and wellbeing
- engineers provide engineering services with reasonable care and skill, including by practising within their areas and levels of expertise
- engineers can be held to account for substandard work or poor behaviour.

MBIE appears to be conscious that poor engineering can potentially lead to significant harm, as seen in New Zealand by examples such as the Christchurch CTV building failure, and from international failures such as the chemical engineering failures at facilities in Flixborough (UK) and Bhopal (India).

Background and context

New Zealand's first regulatory regime for engineers was the Engineers Registration Act of 1924. This Act required all engineers to be registered, to have a recognised qualification and, depending on the qualification, a minimum period of practical and relevant experience of between three and six years. These requirements were augmented by the Chartered Professional Engineers Act of 2002.

The investigation of many prominent engineering failures normally reveals systemic business organisational issues arising from the management and treatment of risk, delegated authority failures, business objectives and poor business process and accountability, all of which set the stage for material engineering failures.

In the infrastructure context it is unclear how risk and accountability is intended to be shared between registered and licenced engineers and Boards of Directors. Current legislation requires directors to be accountable for infrastructure governance and performance. It is up to each individual business entity to decide on the level of technical knowledge its organisational needs and how technical staff gain, maintain and develop knowledge to meet Board-delegated objectives and manage the businesses risks.

Transpower, as part of the Electricity Supply industry (ESI), is governed by the:

- Electricity Act 1992
- Electricity (Safety) Regulations 2010
- Health & Safety at Work Act 2015

- Electrical Codes of Practice.

Together, the legislation, minimum practice guides prepared by industry associations (such as the Electricity Engineers Association and CIGRE¹) and international standards from IEEE² and IEC³ provide the core components to deliver safe public outcomes. The statutes mentioned require the ESI to operate Asset Management Plans and Safety Management Systems for the purpose of ensuring, as far as reasonably practicable, an electricity supply system or electrical works do not present a significant risk of serious harm to any member of the public, or a significant risk of damage to property not owned by the asset owner.

Our position

In the above context, Transpower uses the registration and licencing requirements of its staff and contractors to ensure it can at any point in time demonstrate regulatory compliance as well as the expected competence and accountability of individual engineers, while also ensuring the electricity transmission system (developed, maintained and operated utilising many different types of engineering) is safe throughout its lifecycle.

Transpower is generally supportive of MBIE's registration proposal.

Proposal

1. Establish a new registration scheme for all engineers to ensure a base level of competence and professionalism

Transpower supports all Engineers and Engineering technologists being recorded as having completed a formal course of study after graduation and registered as soon as they have obtained a minimum level of practical experience, joined a professional body for peer support and committed to the code of ethics and ongoing professional development.

There should be a requirement for each individual who maintains registration to commit to:

- ethical standards of professional conduct
- ongoing professional development
- involvement in professional industry bodies and associations.

2. Establish a new licensing regime to regulate who can carry out or supervise engineering work in specified practice fields that have a higher risk of harm to the public

In the context of long-lived electricity infrastructure, which involves many engineering disciplines, how higher risk practice fields are defined will need care. In addition, the nature of the risk associated with an asset changes over time, ownership and changes in asset management practices.

Carefully consideration should be given to how such definitions may or may not interact with other Government policy and legislation. An example is the definition of 'Skilled

¹ CIGRE, International Council on Large Electric Systems, global non-profit organisation founded in 1921 for the advancement of knowledge in the design and operation of large power systems

² IEEE, Institute of Electrical and Electronics Engineers, professional association founded 1963

³ IEC, International Electrotechnical Commission, international standards organisation founded in 1906

Migrant' and how they may be recognised as requiring to meet the standards for which registration or licencing is possible.

3. Set up a new regulator to oversee the registration and licensing process and investigate complaints

Transpower supports establishing a new regulator and regulatory structure to manage registration and licensing of engineers. We acknowledge that the many engineering disciplines, unlike those pertaining for instance to the legal, dental and medical professions, means it is not practicable for one professional engineering body to act as a regulator/disciplinarian and record keeper etc.

Determination of competence and investigation of complaints is likely to be most effective when undertaken by those with specific sector knowledge and experience, such as industry bodies like the Electricity Engineers Association.

The current proposal is silent on issues of risk and liability. The proposed regime will need to understand and address issues such as proportionality of risk shared between an employer and an employed engineer, including the financial capacity of respective parties, the availability of professional indemnity, interactions with ACC etc. For example, in Singapore the costs of obtaining individual indemnity insurance have resulted in regulations requiring business entities to assume liability risks.

Our very clear view is that liability responsibilities should reside with a business delivering engineering services to third parties, rather than there be a regime where individual practitioners are required to self-insure. Only individuals offering such services should self-insure.

Conclusion

Transpower supports changes to the present regulatory settings for engineers. However, the changes should accommodate the responsibilities arising in respect of long-life infrastructure assets which have been developed and maintained relying on multi-discipline engineering inputs, but also noting that the design, building and maintaining of such assets are also regulated through other legislation and application of recognised national and international standards.

Transpower is happy to engage further on this important piece of work and work with MBIE to develop an appropriate regime for multi discipline, long life, large scale, essential infrastructure.



John Clarke

General Manager Grid Development



Stephen Jay

General Manager Operations

Cc: Mark Ryall, Brighid Kelly

APPENDIX A Responses to MBIE'S consultation questions

THE CASE FOR INTERVENTION

- 1. Do you agree there is a case for occupational regulation of professional engineers? Why do you think so?**

Transpower is supportive, with the reservations noted below, of having a regulatory regime for engineers provided stakeholders and industry representative bodies are involved in its development and implementation to ensure the use of offshore engineering experts is not compromised.

- 2. Have we identified the issues with the status quo correctly? Are there any issues that we have not included?**

Generally, yes. However, registration of itself will not necessarily deliver reliable and safe outcomes from engineering works; more is required (in the way of experience, ongoing training, other standards etc). The Electricity Supply Industry (ESI) relies on more than ensure that engineers are registered. The ESI is heavily regulated and provides quality and public safety through by being able to demonstrate compliance with and via the:

- Electricity Act 1992
- Electricity Safety Regulations 2010
- Health & Safety at Work Act 2015
- Electricity Codes of Practice
- Technical standards and codes

Two issues not addressed include:

- How the interrelationships of infrastructure companies' Boards of Directors risk management approach, accountabilities, delegated priorities and resources, and their organisations' Asset Management systems all significantly impact the scope and quality of engineering outcomes.
- Financial and legal liabilities and associated matters such as professional indemnity, insurance, interaction with other legislation such as ACC

- 3. We are unable to verify the number of practising engineers and those who may be operating at substandard levels. Can you suggest information sources for us?**

No comment.

- 4. What is your perception of the overall performance of engineers? Does your perception depend on the engineering discipline? Do you have examples of poor engineering you can share?**

Transpower's experience is that performance within the electricity sector is high. This is because of:

- the existing legislative frameworks and the responsibilities placed on asset owners and boards by other legislation and the common law; and
- the sector's commitment to Continuing Professional Development (CPD), support of local and international professional organisations and bodies (EEA, CIGRE etc) and encouraging support by engineering peers enables these standards to be maintained.

Historical 'engineering' failures are few but can be significant, such as the Ruahihi dam collapse (1981), Wheao canal failure (1982) and the Opua dam (1997). It is important to recognise that legislative and technical frameworks can impact the outcome of projects. For example, the design and construction of the above structures was covered under the Building Act, but operations and maintenance were covered by voluntary guidelines. This situation may reflect more on the deficiencies of the legislative framework rather than the quality of the engineering employed during the design, build and operation of the asset.

PROPOSAL 1: ESTABLISH A NEW REGISTRATION REQUIREMENT FOR PERSONS WHO PRACTISE PROFESSIONAL ENGINEERING

5. Does our working definition of professional engineer and professional engineering services adequately reflect the profession? Can you suggest any changes?

We are generally supportive of MBIE's definition. But we believe the definition of **professional engineer and professional engineering services** should encompass reference to engineers, engineering technicians, engineering technologists, engineering geologists and licensed engineers.

Consideration could be given to the following definitions:

- Engineer/Engineering Technologist/Engineering Technician/Engineering Geologist: an individual who has achieved a recognised engineering qualification.
- Registered Engineer/Engineering Technologist/Engineering Technician/Engineering Geologist : an individual who has achieved a recognised engineering qualification and who has gained suitable experience (min 3 years), committed to the code of ethics, meets the requirements of continued professional development, is an active member of a professional body for ongoing peer support.
- Licenced Engineer: a registered engineer who has achieved some level of professional assessment by a specialist body of their peers.

In the United States the title and position of "Engineer in Training" is recognised and all engineers are classified as such immediately after graduation until such time as they have achieved a defined level of experience.

6. Do you agree that the regime should cover all professional engineers? Are there any disciplines that should be exempted and why?

Yes.

Consideration should be given to including:

- areas of engineering that impact the delivery of infrastructure systems in electricity, gas, water, rail such as software, network, and communications engineering;
- other hazardous areas such as prescribed electrical works, aviation and marine; and
- trade and sub-trade qualified individuals who apply engineering knowledge and standard systems in their roles.

7. Do you agree with establishing a new protected title? Do you have a preference for what it is?

Yes. See our response to Q5 above.

We suggest protection of titles for the terms:

- Engineer
- Engineering Technician
- Engineering Technologist
- Engineering Geologist
- Registered Engineer
- Professional Engineer
- Licenced Engineer

8. Is a qualification enough for registration? Should we also include experience and an assessment of competence?

No.

Adopting the protection of the titles in Q5 would enable recording of all individuals that have completed a formal engineering qualification and provide information about the number and type of engineering professionals of various disciplines and levels of qualification active in New Zealand. It would provide an additional step to ensure relevant experience was obtained.

This would provide assurance that those wishing to use a qualification as a practicing professional engineer/engineering technician etc would be recorded as being qualified to do so, have relevant experience, have demonstrated commitment to a code of ethics, are undertaking ongoing professional development and are a member of a relevant professional body for peer support.

9. Would limiting registration to those with an engineering qualification (such as a Washington Accord level degree or equivalent) exclude some engineers in the profession? How can we recognise those engineers?

Yes, a limitation would arise.

We believe a regime such as described in our responses to Q5, Q7, Q8 would mean all engineers and those engineering technologists could be registered, with differing requirements and experience required for different professional qualifications and application.

10. Do you engage engineers from overseas? Would requiring them to be registered affect your ability to engage their services? Or would overseas engineers be able to work under the supervision of a local engineer?

Yes.

Overseas engineers and engineering specialists are an important resource for delivering ESI projects and assets. Not all of the engineering skills and experience we need to design, build, operate, maintain or repair the power system are available here in New Zealand. Any registration regime must be able to appropriately recognise the qualifications of an individual's original home country. The regime must have the flexibility to allow asset owners to retain offshore engineers and businesses to undertake work for use in New Zealand and for such work to be professionally recognised here. Further, it may not be practicable to have a New Zealand engineer adequately supervise offshore engineering resources as an engineer employed (here) may not have the expertise or experience to do so and would therefore be operating outside their area of expertise and in contradiction of their code of ethics.

The licencing regime must allow for a registered engineer in New Zealand to bring into New Zealand safety critical works service providers and asset providers without the international party having to gain a separate New Zealand licence for providing the assets and related services. It would be impracticable, in our view, for our business, as an example, to have to require ABB to acquire a licence from a New Zealand regulator to undertake work on our HVDC system – work that only ABB has the knowledge and skills to undertake. Further, a regulator would have no relevant experience it could rely on as a basis for issuing such a licence.

11. Do you agree that all engineers should be subject to a code of conduct and continuing professional development obligations? Please share your reasons if you disagree.

Yes.

12. Do you agree with the proposal for a practising certificate? Do you have any other suggestions for how we can link registration to continuing professional development?

Yes. Refer to Q5, Q7, Q8 above.

An individual's practicing certificate should be linked to his/her nominated professional peer body's continuing professional development record.

13. How often should an engineer need to renew their practising certificate?

For a practicing registered engineer or engineering technologist/geologist/technician: annual registered practicing certificate.

For the proposed practicing licenced registered engineer or engineering technologist/geologist/technician: 5-10 years for a licence to be renewed.

14. Should issuing a practising certificate be contingent on an engineer completing their continuing professional development commitments?

Yes.

15. Should electrical engineers registered by the Electrical Workers Registration Board continue under that regime rather than the new one proposed?

This is an issue that will need to be carefully addressed.

The Electrical Workers Registration Board (EWRB) does register engineers, but they undertake prescribed works on "Installations" and "Works". They are not normally applying scientific or engineering principals and knowledge but are instead applying standardised approaches and designs.

In addition, if technicians are to be captured by this regime then relationships to the Electricity Act and Electricity Safety Regulations and EWRB must be addressed.

16. Are there other engineering practice fields that should also be recognised for similar reasons? What are they, and why should they be recognised?

No specific comment but refer response to Q6.

17. Should we include engineering associates, engineering technologists, engineering technicians and/or engineering geologists in the new regime?

Our response to this question is the same as Q5.

18. If we expand the scope, should we make registration mandatory for those practising in these additional areas?

Our response to this question is the same as Q5.

It seems probable that to have a sufficient understanding of how many individuals are practicing engineering (and in what disciplines and at what levels) an expanded scope would require mandatory registration of relevant areas.

19. Is a recognised statutory credential of value for engineering associates, technologists, technicians, and engineering geologists? Why?

No comment

PROPOSAL 2: RESTRICT WHO CAN CARRY OUT OR SUPERVISE HIGH RISK ENGINEERING WORK

20. Do you support the Minister being able to decide what practice fields should be licensed? Or would you prefer greater certainty by setting out licensed practice fields in the primary legislation?

Yes.

We believe the Minister should be able, on the advice of the Regulator, to decide what practice fields should be licensed. Prescribing license practice fields in primary legislation would impede the Regulator from responding to emerging fields of engineering, evolving societal expectations, or changes within the profession. All additions should be Ministerial decision notified by Gazette but after consultation with relevant industry stakeholders.

21. Do you agree with the proposed list of criteria that the Minister would use to prioritise the development of licence classes? Are there other criteria that should be considered?

We support the proposed criteria and recommend the Regulator can establish licence classes where there is a need.

22. What sort of eligibility requirements for licensing would provide a suitable level of assurance on an engineer's expertise? Should they differ depending on the practice field?

The Regulator should prescribe eligibility requirements for licensing with input from the relevant technical society and engineering associations (for example the Structural Engineering Society of New Zealand Electricity Engineers Association, Dam Safety Society) to ensure adequate description of technical requirements.

23. Should licensed engineers undergo regular checks of their continued competency?

Yes.

24. How often should the regulator check a licensed engineers' competency?

The frequency of competency checks should be determined by the Regulator and the relevant industry stakeholders and technical group(s) such as the EEA. But the frequency should be a minimum of 5-10 years. Please refer to Q13.

25. What tools would be most useful to check competency in your practice field?

Depending on the agreed audit framework, it may include but should not be limited to interviews, referee checks, portfolios and written work.

26. Would you prefer using the Chartered Professional Engineering (CPEng) credential for licensing classes rather than creating a new credential? Why?

We would prefer to utilise CPEng as part of a licensing regime. CPEng is a multi-lateral arrangement with other jurisdictions which recognises peer organisations and individuals' experience and qualifications. Loss of this reciprocal recognition would make it more challenging for offshore engineers to be accepted here and, therefore, reduce New Zealand's attractiveness as a place for engineering professionals to practice.

27. Do you prefer the option of licensing companies instead of individuals? Why?

Yes. Our view is firm; a business should carry the responsibility for its work. Sole practitioners should also be able to be licenced.

ESI legislation directs asset owners and boards to manage their public safety risk. Audited public safety management systems, and the electricity safety regulations inform the company's asset management approach. The company itself then determines and delegates how to implement the desired approach, select and train its staff. The effects and interactions of licensing of engineers and how they are impacted by the risk accountabilities and resources are delegated by company boards via the company structure will need to be considered. Questions such as how and when a regulatory body would hold a Board or individual engineer accountable for a failure should be prescribed.

PROPOSAL 3: ESTABLISH A NEW TWO-TIERED REGULATOR COMPRISED OF AN INDEPENDENT REGULATORY BOARD AND A REGULATORY SERVICE PROVIDER

28. Do you agree with the proposed two-tier regulator model of a regulatory board and a regulatory services provider? Are there any other models we should consider?

Yes.

29. Do you have a preference for who the regulatory service provider should be?

Not at this time. But the provider must have enough industry and discipline specific knowledge and capability to fulfil the statutory requirements.

30. Do you agree with the proposed functions of the regulator and regulatory service provider? Can you suggest any different functions?

We believe the functions should be split due to the different skill sets required by a disciplinary and governance boards.

31. Have we missed any other grounds for discipline? Have we proposed grounds for discipline that you think should be modified or removed?

No comment.

IMPLEMENTATION

32. Should the regulator have the flexibility to recognise and automatically deem some existing practitioners as registered and/or licensed?

Yes.

33. Do you have any suggestions for other ways to transition the profession to the new regime?

No comment.

34. Should we retain the Chartered Professional Engineer credential in the longer term? If we do, what role should it play?

This is currently unclear.