ENGINEERING IS GROWING EXPONENTIALLY. CAN PEO KEEP UP?

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Several students at an Ontario university have hit upon the next big thing: an invention that promises to be hugely popular and has the potential to make them very rich. The project is now winding its way through the patents process, and the students are on the cusp of becoming successful entrepreneurs.

It's exciting engineering—except these folks aren't professional engineers and likely have no intention of getting licensed. Their work, which applies engineering principles, falls within PEO's regulatory bailiwick, but it's going on unregulated—as is perhaps untold amounts of engineering work being undertaken by unlicensed people in Ontario in 2018, particularly in emerging disciplines.

I use this fictional example to illustrate what I see as a looming problem at PEO: The *Professional Engineers Act*'s (PEA) primary objectives—protecting the public interest through licensure and setting and enforcing standards of knowledge/skill, practice and ethics—are broad enough to capture emerging engineering disciplines. However, our regulatory focus on licensure and enforcement is proving limited in its capacity to regulate the full gamut of engineering in Ontario, especially in an age when technology is advancing exponentially and growing beyond our means to regulate it all.

ENGINEERING vs PEO's CAPACITY TO REGULATE

The graph on page 7 depicts my thinking on the issue. The vertical axis represents the size of PEO's "regulatory fence"—the engineering work across all disciplines (including emerging ones) that PEO is mandated to regulate within the province. The horizontal axis represents PEO's capacity as a function of time—in licensing and registration, enforcement and discipline and practice guidance—to regulate, across several technological revolutions. The blue line represents PEO's capacity to regulate, beginning at its inception in 1922, while the purple line represents the regulation required to adequately oversee all the engineering practice being undertaken from 1922 to now (and beyond).

As you can see, the two lines align for most of PEO's history, showing how we have, for the most part, kept pace regulating engineering practice over the past century. For most of that time, engineering practice was well defined, encompassing only five or six disciplines, so regulation was straightforward.

As technology—notably electronic and computer technology—has advanced over the past few decades, that line begins to diverge, with PEO's regulatory capacity flatlining or even descending, while technology and engineering move forward. At that point, I would argue, the boundaries (or regulatory fence) of engineering practice have moved beyond PEO's capacity to regulate it all.

The space between the expanding fence and PEO's regulatory capacity represent all those unlicensed people (like the four university entrepreneurs mentioned above) who may be practising engineering and creating new technologies without the benefit of a licence or any kind of oversight.

PEO LOSING GROUND

So why is PEO falling behind? I think it's for a couple of reasons. First, as mentioned earlier, although our act is sound, we lack the regulatory compliance resources to enforce licensure and exclusive rights to practice—we're playing whack-a-mole trying to ferret out and act against non-licensed individuals and practice. And second, many new engineering graduates don't seem to see the value in getting licensed; and this thinking was borne out in recent focus groups conducted by PEO's Public Information Campaign Task Force. "There was no drive from the organization [to get licensed], and progress in career happened anyway," one participant said. "Why put myself through the extra work and emotional distress associated with the process, for no added value?"

This thinking is likely even more prevalent among graduates working in emerging disciplines, and a case in point is software engineering. Back in 2001, attempts were made to bring this area of practice into PEO's regulatory fold, but as former PEO president George Comrie, P.Eng., FEC, noted in his September/October 2016 *Engineering Dimensions* column (p. 3): "The net result of our tardiness in embracing software engineering as a regulated engineering discipline allowed non-engineers to dominate the field, and to this day, it remains essentially unregulated. I believe it can be argued that the public has suffered from the consequences of lack of discipline and accountability in the development and management of software systems."

POTENTIAL SOLUTIONS: PUBLIC DEMAND AND ENTITY REGULATION

If the public knew the full scope of unlicensed practice going on within these new technologies created by emerging disciplines, I think we would see a backlash. Just as the public presumably would not go to an unlicensed individual or firm to design a building, why would they feel any different about, say, a communications infrastructure project? The value proposition in hiring a licensed engineer is the same: They are well educated and experienced, abide by a code of ethics responsible for safeguarding life, health and public welfare and are accountable to a regulator.

Perhaps public demand is the regulatory driver we need to reign these people in and close our regulatory gap. If the public doesn't see a PEO logo on the bottom of a com-

pany's website and a list of P.Engs on their team, they may look elsewhere to those who do—secure in the knowledge that the people they're dealing with will do the job right, providing product or work with honesty and integrity and are ultimately answerable to PEO.

I think that kind of bottom-line impetus would spark more than a few firms to get their people licensed.

To capitalize on this public demand, PEO needs to focus more on regulating the entity that provides engineering services as opposed to regulating the individual engineer. By doing so, we would require that the entity be accountable under the PEA, as opposed to our current approach of trying to regulate individual practitioners. We already do this through our certificates of authorization, but it needs to be strengthened and aligned for this purpose.

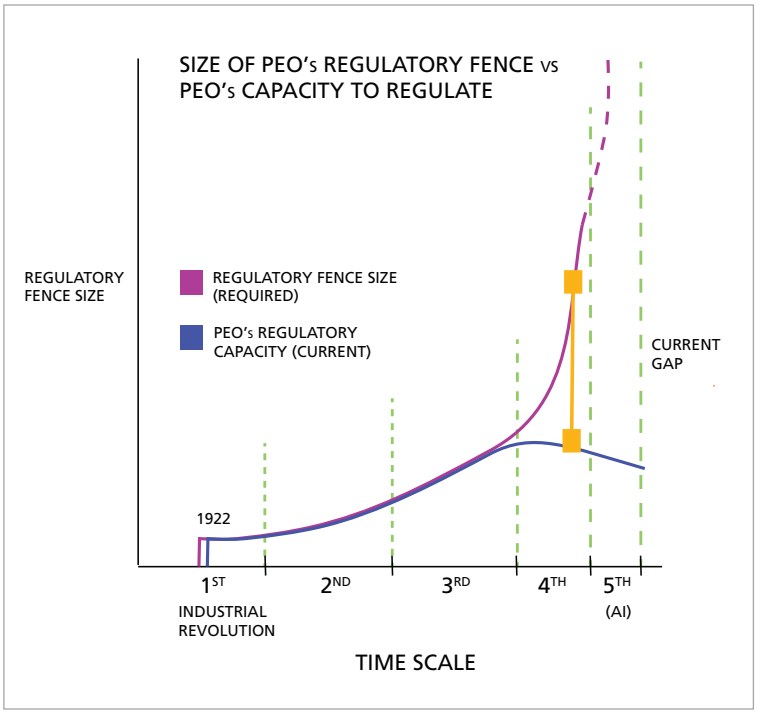
The concept—entity regulation—is already attracting much attention among Canadian legal regulators and is currently being rolled out as the new regulatory framework of the Nova Scotia Barristers' Society (NSBS).

The model moves the regulatory focus from the individual practitioner to a group of practitioners who work together, whether that's a consulting firm, an in-house department or government department. If someone is a sole practitioner, the entity is the sole practitioner.

Entity regulation is also compliance based, with fewer rules and requirements and is something our current government is moving towards. Instead, the model holds entities accountable to uphold public interest–based principles or regulatory objectives—how the entity meets them is up to its discretion. For example, the NSBS' new framework has 10 Management System for Ethical Legal Practice objectives, including developing competent practices, ensuring confidentiality, maintaining appropriate file and records management systems and avoiding conflicts of interest, among others.

Some regulators investigating entity regulation are exploring the idea of entities appointing a compliance manager who would both report compliance to the regulator and address issues within the entity if the regulator finds problems.

According to the Canadian Bar Association's 2014 report *Futures: Transforming the Delivery of Legal Services in Canada*, when Australia adopted a similar approach, it resulted in a two-thirds drop in complaints against legal services providers in New South Wales.



Although an entity-based regulator is still in charge of licensing and registration, complaints and discipline and practice guidance, it offloads oversight of individual practitioners to their employers. And if we're struggling to maintain our regulatory "fence" around an exponentially expanding engineering profession, limiting our regulatory purview to thousands of entities versus tens of thousands of individual practitioners will at least give us a fighting chance at keeping up.

If you couple this with a well-informed public that demands licensure from providers of any and all engineering products and services, I think you have a recipe for success. If practitioners and firms are operating in a business environment where public expectations around quality, ethics and accountability dictates the need for engineering licences, they have no options. They get licensed or they go bust.

My point is that the world is not going to stop and wait for us to catch up. There is a lot of engineering going on in this province, and we're not regulating all of it. Nor can we, I would argue, under our current regulatory framework.

If we're going to close our regulatory gaps—gaps that are widening every year—we need to change the way we look at licensure. **e**