

Ensuring Competence for Professional Registration

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Introduction

Professional registration for engineers practicing in Queensland (Australia) is a legislated requirement. Originally, applicants were required to have a recognised engineering qualification, to have five years experience, prepare a written submission and undertake an interview for registration.

In July of 2008, amendments were made to the registration process to include the assessment of an individual against agreed competency standards. Individuals are now required to demonstrate competence against the three core standards and two electives. The board approved Engineers Australia (EA) as an assessment entity and adopted the competency standards developed by EA. The board also approved the Institution of Fire Engineers Australia and the Australasian Institute of Mining and Metallurgy. The competencies set down by EA best match the engineering practices of the Department of Transport and Main Roads.

Demonstrating competence against defined standards is a new experience for the vast majority of graduate engineers. In many cases they find it difficult to translate the activities they undertake at work into the competency standards set down for professional registration. This paper will detail the work undertaken by the Technical Education and Innovation (TE&I) branch to develop a system that supports graduates across the Department of Transport and Main Roads (Queensland). Many graduates are located in rural or remote regions of Queensland adding to the challenge of providing support.

Engineers Australia has fourteen competencies in all, three core and eleven electives. A person seeking registration as a professional engineer must be deemed competent by the assessors of EA against the three core competencies and two electives. These are broad competencies and it is expected an individual would need between three and five years under the supervision of a Registered Professional Engineer of Queensland (RPEQ) to gain the necessary experience to develop the competencies.

The Department of Transport and Main Roads Queensland currently has 72 graduate engineers.

Graduate Program

Historically the department's graduate engineers program had been run by a committee made up of senior engineers and a representative from human resources. This committee relied on annual rotations as a means of developing individual graduate engineers. This saw individuals being transferred between regional offices around Queensland. While the committee had adopted the competency standards set down by Engineers Australia, there was no process in place to track progress or to assess competence.

Review of the Graduate Program

Following discussions with the Board of Professional Engineers on changes that the board was proposing to the Act in 2008 and concerns being raised by graduate engineers and managers alike, it was decided to undertake a review of the graduate program. This review was undertaken independently of the committee by members of TE&I.

It was found that graduates were encouraged, by the committee overseeing the graduate program, to join Engineers Australia and submit career episode reports to be assessed against the competency standards but there was no compulsion to do so. The rotational placements were based on sending an individual to a regional office where local management was relied on to provide suitable learning opportunities and provide guidance. Managers in the regional offices are busy people and for the most part they have been unable to devote the time necessary to the development of the graduate engineers under their supervision.

There were no clearly stated learning outcomes for the placement or for the overall program. As a result there was no consistency in the outcomes of the program and there was no clearly defined end to the program.

Furthermore, it was found that within the program, a graduate was deemed to have finished the program when the individual has been successful applying for a position at the next salary level. This had been based on historical data from the eighties and nineties that showed graduate engineers had remained at the lower level for between three to five years before being able to advance to the next level. This had changed significantly in recent years due to the global shortage of skilled labour. In some instances, graduates were successful in applying for positions at the next salary level after only six months.

The responsibilities set down for this next level require the individual to supervise the work of other engineers and technical professionals, in effect, the person is regarded as a professional engineer who should be able to work autonomously. By and large, graduates were being used to fill vacant positions within regional offices with little or no attention being given to their development.

Numbers of graduate engineers on the program had averaged around forty during the years leading up to the review. It was alarming to find that only one graduate per intake was voluntarily submitting to the assessment process put in place by EA.

The review also revealed that there was no departmental policy requiring engineers to be registered with the Board of Professional Engineers. This resulted in many senior engineers believing that registration was not necessary which was surprising given that it is a legislated requirement.

As part of the review, road agencies in other states were contacted and the details of their graduate programs were examined. This proved to be beneficial as the successful programs were all found to have clearly defined learning outcomes. This in turn would strengthen the recommendations of the review by being able to provide examples that supported the proposed approach.

The Way Forward

The findings of the review and recommendations were presented to the graduate development committee and the Chief Engineer. The recommendations included the development of a policy to ensure the department satisfied the legal requirements for professional engineers, clearly defined learning outcomes linked to EA competency standards and placements that were in turn linked to the learning outcomes. The recommendations were endorsed by the Chief Engineer and TE&I was tasked with drafting a system that supported the development of competence based on the EA standards.

To guide graduates in their development and their managers in linking workplace opportunities to the individual's learning needs, a Graduate Learning Plan was developed. A task analysis was undertaken of the work typically done by graduates. It was found that there were four broad functions where these activities were undertaken. These functions were in maintenance, construction, design and planning. These functions were then used to select the most appropriate, elective competency standards.

One of the difficulties that had been experienced under the graduate program, prior to the review, had been very strong resistance to the rotations being based on transfers to other locations. This resistance came from both the graduates and their management. It was found that there was no empirical evidence to support this practice of rotations between regions. It was decided when developing the learning plans that the rotations or placements as they were to be known should be on a functional rather than a locality basis. This would ensure the graduate was exposed to the full range of activities available while at the same time avoiding the potential disruption caused by relocation.

Learning objectives were developed for each of the functions in which graduate engineers would be placed. These were listed in the learning plan. Likely tasks or project related activities were also listed against the function.

The tasks or project related activities within a given function were then matched to the performance criteria contained within the appropriate EA competency standard. Internal technical training courses were also matched to the function to ensure the theory supports the practical activities being undertaken in the workplace.

Provision has been made within the learning plan for the supervisor to verify that the graduate has undertaken the activities and technical training listed against the function. The graduate can also record on the learning plan the Career Episode reports that have been submitted to EA. The learning plan then becomes a useful record of the graduate's development and is accepted as evidence by EA.

A group of experienced engineers was asked to review the draft learning plan before it was released for use. In addition to the release of the learning plans, a series of information sessions was held around the state to explain their use to both the graduate and their managers. At these sessions, guidance was also given on how to prepare Career Episode Reports.

In addition to the development of the learning plan and the change from regional rotations to functional placements, TE&I commenced work on a policy that would provide clarity on the departmental requirements for the registration of its engineers. This latter task would prove the most difficult to reach broad agreement on.

Progress to Date

The departmental policy on the registration of its engineers came into effect recently. This policy makes it mandatory for the department's engineers to be registered with the Board of Professional Engineers before they can move to a specific level on the salary scale. Because this policy will ensure full compliance with the registration requirements, the results associated with the introduction of the learning plans have been drawn from the period immediately prior to the implementation of the policy.

As stated earlier, prior to the introduction of the learning plans, at best only one graduate per cohort was submitting Career Episode Reports and successfully being assessed by EA as competent. This was entirely due to the individual's motivation. Just prior to the introduction of the policy making it compulsory for engineers to seek registration, the number of graduates who had submitted Career Episode Report had grown to twenty four out of seventy two on the graduate program.

This can be considered a good result given the short time the learning plans had been in place. With the introduction of registration being compulsory for engineers, it is expected that all graduates will undertake assessment due to the implications associated with promotion.

A comparison of the department's overall activity rate against that of other organisations within Queensland seeking to have their engineers assessed by EA shows a significant improvement. Prior to the introduction of the learning plans the department's level of activity ranked at or near the bottom of the table. The results released recently now show the department ahead of both the Queensland and the national average. There are three other organisations in Queensland that have higher activity rates according to these results.

Feedback from both graduates and managers has been positive and supportive. There is a real appreciation from the managers who find their task made simpler through the provision of clear guidance on the development of graduates under their control.

Learning plans were also developed for other engineering related professions such as designers and surveyors. The learning plans represent the first phase of an individual's career as a professional. Work is currently being undertaken to produce career development plans that will provide clear guidance to professionals. The intent of these career development plans is to ensure the individual is competent to discharge their responsibilities at their present levels and prepare them for progression to more senior roles.

Conclusion

Our experience has demonstrated that learning plans linked to competency standards can assist both the graduate and their manager in developing competence by guiding learning in the workplace. Providing clear learning objectives for functional placements combined with guidance on activities and training that will develop a person's abilities against specific criteria ensures the individual's efforts are focussed on developing the competence needed to fulfil their professional obligations.

It also demonstrates that adult education professionals can play an important role in the development of both individual and organisational capability by bringing to bear skills that generally do not possessed by human resource professionals. This is often overlooked in organisations.