



Professional Engineers
Ontario

GUIDE TO *the* REQUIRED EXPERIENCE

for a *Limited Licence* in Ontario



Published by Association of Professional Engineers of Ontario, March 2014

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1. Introduction

Professional Engineers Ontario (PEO) is empowered under the *Professional Engineers Act* to establish the standards for admission and to regulate the practice of engineering in the province to serve and protect the public interest.

A limited licence is a licence to practise professional engineering within an approved limited scope.

This Experience Requirements Guide aims to provide engineering, technology or science graduates who wish to apply for a limited licence, their supervisors, referees and employers an understanding of the experience requirements for a limited licence. The profession relies on individuals and firms that provide experience opportunities to engineering, technology or science graduates and act as referees in the licensure process.

The suitability of an applicant's experience for licensure is assessed against five criteria that define acceptable engineering experience, which are described further in section 2.1 of this guide.

The criteria are:

- application of theory;
- practical experience;
- management of engineering;
- communication skills; and
- social implications of engineering.

Applicants are responsible for demonstrating that the engineering experience requirements have been met to the satisfaction of PEO. This guide refers only to the engineering experience requirements for the limited licence. For information concerning the requirements for any other licence issued by PEO, the certificate of authorization to offer or provide engineering services to the public, or designation as a consulting engineer, please contact PEO.

2. PEO's Engineering Experience Requirements

Applicants who satisfy the experience requirements described in this guide will have confirmed that they have the ability to exercise sound engineering judgment, function on multidisciplinary teams, and communicate effectively in the work environment and with society at large. This experience, however, should be considered simply a first step in the lifelong process of continued learning, to ensure continuing competence as a limited licence holder is maintained.

The period of supervised engineering experience provides an internship for individuals who have the necessary academic qualifications to hold a limited licence. PEO examines the nature, quality, duration and currency of each applicant's experience with one or more employers, and evaluates this experience against the prescribed criteria. Individuals and firms providing experience opportunities act as referees in the licensing process.

APPLICANTS FOR A LIMITED LICENCE

- must hold a three-year degree or diploma in an engineering, technology or science program or have equivalent educational qualifications, with knowledge that corresponds to the scope of services within the practice of professional engineering to be provided under the limited licence;
- must demonstrate at least eight years of experience in the practice of professional engineering
 - with at least six years of the experience corresponding to the scope of services within the practice of professional engineering to be provided under the limited licence, and
 - at least four of those six years' experience acquired in a Canadian jurisdiction under the supervision of one or more people legally authorized to engage in the practice of professional engineering in a Canadian jurisdiction;
- must pass the Professional Practice Examination;
- must demonstrate that they are of good character; and
- must pay the applicable fees prescribed by the Regulation.

Engineering experience should be compatible with the applicant's proposed scope of limited licence.

2.1 CRITERIA FOR ACCEPTABLE ENGINEERING EXPERIENCE

Experience is a major component in preparing an engineering, technology or science graduate to hold a limited licence. Firms that provide the working environment and individuals who provide supervision during the internship period are responsible for providing the appropriate environment, opportunity, range and progression of activities to meet PEO's experience criteria.

Two mandatory components of acceptable engineering experience—*application of theory* and *practical experience*—must be demonstrated over a substantial part (but not necessarily all) of the internship period. They must be supplemented by exposure to, or experience in, the broad areas of *management of engineering*, *communication skills* and *the social implications of engineering*. Without at least some appropriate exposure to each of these other components, an applicant will be ineligible for licensing.

2.1.1 Application of Theory

Skillful application of theory is the hallmark of quality engineering work. Experience must therefore include meaningful participation in at least one aspect of the following applications of theory:

- *analysis*, including scope and operating conditions, performance assessment, safety and environmental issues, technology assessment, economic assessment, reliability analysis;
- *design and synthesis*, including functionality or product specification, component selection, integration of components and

sub-systems into larger systems, reliability and maintenance factors, environmental and societal implications of the product or process, quality improvements;

- *testing methods*, including devising testing methodology and techniques, verifying functional specifications, new product or technology commissioning and assessment; and
- *implementation methods*, including applying technology, engineering cost studies, optimization techniques, process flow and time studies, cost/benefit analysis, safety and environmental issues and recommendations, maintenance and replacement evaluation.

2.1.2 Practical Experience

Practical experience provides applicants an appreciation of the fundamental roles of function, time, cost, reliability, reparability, safety and environmental impact in their work. Practical experience should include such components as:

- *the function of components as part of the larger system*, including, for example, opportunities to experience the merits of reliability, the role of computer software, or the relationship of the end product to the equipment and to the equipment control systems;
- opportunities to experience and understand *the limitations of practical engineering and related human systems in achieving desired goals*, including, for example, limitations of production methods, manufacturing tolerances, operating and maintenance philosophies, ergonomics;
- opportunities to experience *the significance of time in the engineering process*, including difficulties of work flow, scheduling, equipment wear out, corrosion rates and replacement scheduling; and
- opportunities to acquire *knowledge and understanding of codes, standards, regulations and laws that govern applicable engineering activities*.

2.1.3 Management of Engineering

Management of engineering projects includes supervising staff, managing projects, being exposed generally to an engineering business environment, and managing technology from a societal perspective. Acceptable management components involve:

- *planning*, from identifying requirements, developing concepts, evaluating alternative methods and assessing required resources, to planning for the social ramifications;
- *scheduling*, from establishing interactions and constraints, developing activity or task schedules, allocating resources, and assessing the impact of delays, to determining and assessing projects' interactions with other projects and the marketplace;
- *budgeting*, from developing conceptual and detailed budgets identifying labour, materials and overhead, to assessing risk of cost escalation, and reviewing budgets in light of change;
- *supervision*, including leadership and professional conduct, organizing human resources, motivating teams, and managing technology;
- *project control*, requiring understanding of the elements of a greater whole, coordinating phases of project work, and monitoring expenditures and schedules and taking corrective action; and

- *risk assessment*, relating to operating equipment and system performance, technological risk, product performance, and social and environmental impacts.

2.1.4 Communication Skills

An opportunity to develop communication skills is an important experience requirement. This applies to all areas of the work environment, including communication with supervisors, co-workers, government regulators, clients and the general public. For an applicant's experience in this area to be acceptable, the applicant should have regular opportunities to participate in:

- *preparing written work*, including day-to-day correspondence, design briefs, and participating in preparing major reports;
- *making oral reports or presentations* to co-workers, supervisors and senior management, and to clients or regulatory authorities; and
- *making presentations to the general public* as such opportunities arise.

2.1.5 Social Implications of Engineering

As emphasized in many of the experience components associated with the other four quality-based experience criteria, the social implications of engineering are an important aspect of engineering practice. A professional engineering work environment is one that heightens an applicant's awareness of the social consequences, both positive and negative, of an engineering activity undertaken. While not every project or activity will have direct or immediate social consequences, an applicant's work experience should, nevertheless, instill an awareness of:

- the value or benefits of engineering works to the public;
- the safeguards in place to protect the employees and the public and mitigate adverse impacts;
- the relationship between engineering activity and the public at large;
- the significant role of regulatory agencies on the practice of engineering; and
- the impact of engineering on environmental sustainability.

Experience in this area should foster an awareness of a limited licence holder's professional responsibility to guard against conditions dangerous or threatening to life, limb, property, or the environment, and to call such conditions to the attention of those responsible.

2.2 LENGTH OF EXPERIENCE

All applicants for a limited licence are required to demonstrate at least eight years of verifiable engineering experience that meets the criteria set out in this guide before licensing can be obtained.

At least six years of the experience corresponding to the scope of services must be within the practice of professional engineering to be provided under the limited licence.

At least four years of those six years' experience must be acquired in a Canadian jurisdiction under the supervision of one or more people legally authorized to engage in the practice of professional engineering in a Canadian jurisdiction.

2.3 ROLES OF REFEREES AND SUPERVISORS

Individuals who serve as referees in support of a candidate's application are a vital component of the licensing process. Three references from individuals who are familiar with the details of the applicant's work are required. It is strongly recommended that two of these references come from professional engineers and at least one be from a person in authority at the applicant's place of employment or at a client firm. The applicant's present and past direct supervisors are the most suitable referees. If an applicant is claiming experience from multiple work situations, additional referees may be required.

Referees should provide information regarding the applicant's technical ability in the application of theoretical engineering principles, ability to clearly communicate orally and in writing, ability to work on a team and to exercise professional judgment. Referees should also attest whether the applicant is of good character, as demonstrated through such personal attributes as honesty and integrity.

2.3.1 Role of Supervisor as Referee

Professional engineers who serve as supervisors and referees are obliged to:

1. Provide guidance, encouragement and support to the applicant during the internship period;
2. Provide the applicant a working environment that offers the opportunities to receive acceptable experience;
3. Be sufficiently familiar with the details of the applicant's work, either through direct supervision or ongoing direct contact, to be able to attest that each portion of the work experience qualifies within the context of this Experience Requirements Guide; and
4. Endorse the proposed limitation statement.

2.4 ROLE OF THE EMPLOYER

Providing a working environment that will enable engineering, technology or science graduates to enter limited licence practice is in the best interests of an employer. Employees seeking licensure are demonstrating to their employers that they embrace the concept of professionalism, and are willing to be bound by the profession's Code of Ethics requiring fairness and loyalty to employers, colleagues and clients.

As part of providing a working environment that is conducive to licensure, employers are encouraged to instill an appreciation of the need for prospective limited licence holders to commit to lifelong learning and to join technical societies.

Employers of prospective limited licence holders should be aware of PEO's licensing requirements, particularly the five quality-based criteria against which the experience of their employees will be evaluated (section 2.2). Where an applicant is involved in sales or marketing activities, construction management, supervision, or maintenance, particular attention should be paid to section 3 for an interpretation of the experience requirements relative to these activities.

The working environment that provides, to the greatest extent possible, opportunities for licence applicants to obtain appropriate and acceptable experience is one in which the employer provides:

- the applicant sufficient exposure to a significant majority of the components described in section 2.1 of this guide;
- a progression of activities and experiences leading to the applicant's increased involvement and responsibility with time; and
- the applicant direct supervision by or on-going contact with a professional engineer during the various components of the experience.

3. Interpretation of Engineering Experience Requirements in Specific Areas of Practice

3.1 UNIVERSITY TEACHING

Applicants whose engineering experience consists of, either in whole or in part, university teaching will be evaluated to ascertain if the teaching experience complies with the criteria for acceptable engineering experience. To be considered acceptable engineering experience, the teaching of upper-year engineering science, analysis or design courses needs to be supplemented by such activities as providing specialized advice to industry or conducting or supervising applied research. However, the teaching of basic courses to students in the early years of their degrees may not constitute acceptable engineering experience. Also, teaching outside of an engineering faculty does not fall within the definition of the practice of professional engineering. PEO will assess the actual tasks performed by these applicants to delineate those portions of their tasks that are acceptable engineering experience for licensing purposes.

3.2 COMMUNITY COLLEGE AND TECHNICAL INSTITUTE TEACHING

Under normal circumstances, community college and technical institute teaching falls outside the definition of acceptable engineering experience. However, industry consultations and employment undertaken during sabbaticals or of a part-time nature may be considered, and will be evaluated against the experience criteria.

3.3 SALES AND MARKETING ACTIVITIES

Sales and marketing activities can vary immensely from position to position and can similarly vary from tasks that have little or no requirement for engineering expertise, and thus little engineering experience gained, to positions where a high level of engineering competence is necessary. Applicants whose experience has been entirely or partially in the areas of sales and marketing will be evaluated carefully, having due regard to the actual tasks that have been performed, the degree to which the mandatory experience component of "application of theory" has been achieved, and whether the applicant's work has required the supervision of a professional

engineer. In most circumstances, an applicant whose sole employment has been in the area of sales and marketing will require employment for more than the minimum experience requirement to obtain suitable engineering experience. Consideration will be given to the following types of experience:

- providing professional advice and guidance in the selection of equipment, a product or service;
- providing technical assistance during the application of a process or installation of equipment;
- conducting technical seminars for engineers as part of the marketing of specialized materials, equipment or processes;
- design work associated with the marketing and sale of materials, equipment or processes.

Suitable experience will not be gained from doing clerical tasks, routine administration, or the simple act of persuading a customer to purchase a product or service.

3.4 MILITARY EXPERIENCE

Graduates in the armed forces sometimes find themselves in line positions that may provide command experience of great value to personal development, but limited value in meeting the experience requirements for engineering licensing. The experience of these applicants will be treated the same as that of those working in civilian occupations.

It is important that applicants provide a complete description of activities so they can be evaluated against the criteria for acceptable engineering experience.

3.5 PROJECT MANAGEMENT AND SUPERVISION

Applicants whose sole experience has been in the field of project management or supervision will be evaluated carefully to ascertain if the requirements for “application of theory” have been adequately met. Under normal circumstances, if an applicant’s sole engineering experience has been in construction management, it is unlikely that this experience criterion will have been satisfied. The applicant may be advised to take a position for a period of time in a role that involves application of theory, to supplement the experience gained in a construction management or supervisory role.

Well-documented evidence of field experience in “problem solving” and development of sound engineering judgment may satisfy the “application of theory” criterion.

Consideration will be given to the following types of experience:

- scheduling and cost control of large, highly technical projects, utilizing sophisticated scheduling and control techniques;
- technical supervision of the construction and installation of materials and equipment where engineering analysis and/or calculation are applied;
- problem-solving and component design.

It is unlikely that suitable experience will be gained from duties involving preparing bids not requiring engineering evaluation, or from ordering materials.

3.6 OPERATIONS AND MAINTENANCE

With the increasing complexity of industrial processes, it is possible there will be applicants whose entire employment, after graduation, has been in the area of operations and maintenance. Again, as in many of the classifications above, the applicant will be carefully evaluated for “application of theory.”

PEO will evaluate the applicant’s actual work history, responsibilities, and degree of involvement in analysis and design. Work experience exclusively in the area of operations and maintenance will frequently fall short of the requirements for licensing and the applicant will be advised to obtain experience in a position involving the application of theory.

Consideration will be given to the following types of experience:

- designing, developing, and upgrading product or production systems specifications;
- providing technical assistance during commissioning of structures, equipment, processes or systems;
- designing, developing, managing, and upgrading maintenance programs;
- developing, managing, and upgrading methodologies for production planning and scheduling, inventory management, process, quality and cost control;
- developing and upgrading production standards and analyzing production problems;
- analyzing equipment failures and applying nondestructive evaluation methods.

Suitable experience will not be gained from duties involving purchasing materials, equipment and supplies of a non-technical nature, collective bargaining or the administration of collective agreements, or from supervising workers on a day-to-day basis in the performance of routine maintenance.

3.7 QUALITY CONTROL AND QUALITY ASSURANCE

The quality engineering function is a very important one in many enterprises. It is very common for some applicants’ entire employment after graduation to be in the area of quality control and quality assurance. Again, as in many of the classifications above, such applicants will be carefully evaluated for “application of engineering theory.”

PEO will evaluate the applicant’s actual work history, responsibilities and degree of involvement in engineering analysis and design. Work consisting exclusively of inspection or implementation of prescribed testing procedures with the sole purpose of finding out whether a particular product’s dimensions/composition/performance meets a pre-established standard will frequently fall short of the requirements for licensing and the applicant will be advised to obtain experience involving the application of “engineering theory” to any phase of the life cycle of systems, structures and/or components.

In general, consideration will be given to the following types of experience:

- developing plans and technical procedures to ensure that critical attributes of a product are identified, monitored and controlled during any phase of a product life cycle;
- engineering analysis and investigation to find the root cause of a deviation from engineering specifications, failure of a product, or any other deficiency identified during the life cycle of a product;
- addressing an identified root cause for a non-conformance by recommending/applying modifications to the engineering design and/or fabrication process;
- analysis of engineering design requirements of a product against technical specifications and applicable regulations/codes/standards to assess the degree of compliance with such requirements.

4. Engineering Experience Record

The final section of this guide covers the format that should be used when submitting your experience record for evaluation by PEO. An applicant should prepare this summary carefully, and complete it only after becoming familiar with the contents of this guide. PEO will then advise on areas in which your experience may not yet meet the necessary criteria. Applicants who are being offered the opportunity to attend an Experience Requirements Committee interview should follow the specific guideline provided at that time.

You must give a clear summary of your engineering experience in a reverse chronological format by month and year. Include names and addresses of all employers and a technical outline of the nature of the duties and responsibilities associated with each position. Periods of absence from employment (travelling, unemployed) should also be listed with dates.

Satisfactory engineering experience is that which complements your academic engineering training. Activities should involve engineering, design, analysis and synthesis, and provide for the development of responsibility, judgment, communication skills and self-confidence.

The elements of satisfactory engineering experience for licensing purposes are described in section 2.1 of this guide. Substantial exposure to the first two, “Application of Theory” and “Practical Experience,” are mandatory, while reasonable exposure to the remaining three elements is sufficient. A complete lack of exposure to any one of the elements may render the applicant unsuitable for licensure.

Some quality aspects to be assessed include: increasing work complexity; increasing responsibility; the effect of employment interruptions or changing assignments on the applicant’s retention of, and ability to build upon, the experience gained; employment responsibilities that are not of an engineering nature; whether the engineering work performed was in the discipline of graduation;

and the degree of supervision by, and guidance of, professional engineer(s).

All of the above-noted factors are taken into account when assessing the final experience record. The simple passage of time is not sufficient.

To assist with PEO’s review and help you ensure that your experience record provides adequate information, it is suggested that your record be organized as follows:

- For each position about which you are reporting, give the dates (day, month and year), position title, company name and a paragraph describing your job responsibilities with an emphasis on the engineering duties. Clearly indicate WHAT you did, HOW you did it and WHY you did it; and
- Describe how the work experience obtained in that position meets each of the five criteria (application of theory, practical experience, management of engineering, communication skills and social implications of engineering), paying particular attention to the “application of theory.”

Applicants are reminded that the experience record is not a résumé for use in applying for employment. It is a record of your engineering experience and, as such, must inform PEO as to the specific engineering work you have personally performed. Please avoid the use of the third person. Terms such as “manage”, “review” or “direct” are imprecise and should be avoided when discussing your experience under the application of theory. Questions concerning the engineering experience required for licensing, or the licensing process, should be directed to PEO’s Licensing and Registration Department at (416) 224-1100 or (800) 339-3716, or write to us at PEO, 40 Sheppard Avenue West, Suite 101, Toronto ON M2N 6K9. We can also be reached by fax at (416) 224-8168 or (800) 268-0496.



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