



Components of Acceptable Engineering Work Experience
(Regulatory Bylaws Appendix 3 and Engineers Canada Interpretive Guide IV)

Work experience is an essential element in determining whether or not an individual is acceptable for professional licensing. The responsibility for providing the proper environment, opportunities, range and progression of activities necessary to meet the work experience requirements rests with the employers of applicants, and the individuals who provide supervision during the internship period. Acceptable engineering work experience must include the application of theory and should provide exposure to, or experience in the following broad areas: practical experience, management, communication, and the social implications of engineering. Assessment of the acceptability of the work experience is based on the extent to which the applicant's experience includes these areas, each of which is outlined in the following sections. Further information on the definition of satisfactory experience can be found in *Experience Guideline 1 – Guideline on Work Experience Reporting for Members-in-Training, Supervisors and Mentors*.

1) Application of Theory

The skillful application of theory is the hallmark of quality engineering work, and an applicant's experience shall include meaningful participation in one or more of the following:

- A) analysis (for example: scope and operating conditions, feasibility assessment, safety and environmental issues, technology assessment, and economic assessment, etc.);
- B) design and synthesis (for example: functionality or product specification, component selection, integration of components and subsystems into larger systems, reliability and maintenance factors, human and environmental aspects, and the societal implications of the product or process, etc);
- C) testing methods (for example: devising testing methodology and techniques, functional specification verification, and new product or technology commissioning and assessment, etc.); and,
- D) implementation methods (for example: technology application, engineering cost studies, optimization techniques, process flow and time studies, quality assurance implementation, cost/benefit analysis, safety and environmental issues and recommendations, and maintenance and replacement evaluation, etc.).

2) Practical Experience

Practical experience allows applicants to understand the practical limitations of real systems. Practical experience should include:

- A) site visits to existing engineering works, with opportunities to see equipment and systems in both operational and maintenance circumstances;
- B) application of equipment as part of the larger system, including, for example, the merits of reliability, the role of computer software, and understanding the end product or engineering work in relationship to the equipment;
- C) opportunities to experience and understand the limitations of practical engineering and related human systems in achieving desired goals, including limitations of production methods, manufacturing tolerances, performance minima, maintenance philosophies, etc.; and,
- D) opportunities to experience the significance of time in the engineering process, including workflow, scheduling, equipment wear-out and replacement scheduling, etc.

3) Management of Engineering

Management of engineering works includes the supervision of staff, project management, general exposure to an engineering business environment, and the management of technology. Engineering management includes:

- A) planning, from conception through to implementation. This includes: needs assessment, concept development, assessment of resources required, and assessment of impacts, including societal and project implementation;
- B) scheduling, from establishing interactions and constraints, developing activity or task schedules, and allocation of resources, through to the assessment of delay impacts and beyond to broader aspects, such as interactions with other projects and the marketplace;
- C) budgeting, including the development of preliminary and detailed budgets, identifying labour, materials and overhead, risk analysis, life-cycle analysis, and tracking;
- D) supervision, including leadership, professional conduct, organization of human resources, team building, and management of technology;
- E) project control, including co-ordination of work phases, tracking and monitoring costs and progress, and implementing changes to reflect actual progress and needs; and,
- F) risk-analysis related to operating equipment and system performance, product performance evaluation, and evaluation of societal and environmental impacts.

4) Social Implications of Engineering

The overriding objective of the “social implications of engineering” requirement is to provide experiences which increase awareness of an engineer's professional responsibility to guard against conditions dangerous or threatening to life, limb, property, or the environment, and to call any such conditions to the attention of those responsible. The social implications of engineering are an important aspect of the practice of engineering. The work environment should provide opportunities for applicants to heighten their awareness of the potential consequences of engineering work. This should include:

- A) a recognition of the value and benefits of the engineering work to the public;
- B) an understanding of the safeguards required to protect the public and methods of mitigating adverse impacts;
- C) an understanding of the relationship between the engineering activity and the public;
- D) a demonstrated interest and involvement in the broader social implications of engineering;
- E) an appreciation of the role of regulatory bodies on the practice of engineering; and,
- F) an understanding of the provincial health and safety of the workplace legislation.

5) Communication Skills

Developing and practicing communication skills is an essential experience requirement. This applies to all areas of the work environment including communication with superiors, colleagues, regulators, clients, and the public. Applicants should have regular and progressive opportunities to participate in:

- A) preparation of written work, including day-to-day correspondence, record-keeping, and report writing;
- B) making oral reports or presentations to colleagues, supervisors, senior management, and an exposure to, or participation in, reports to clients and regulators; and,
- C) making public presentations.