

Appendix 4

Limited License – Components of Acceptable Engineering & Geoscience Work Experience

COMPONENTS OF ACCEPTABLE ENGINEERING WORK EXPERIENCE

Part 1 – APPLICATION OF THEORY

Application of theory is an extremely important part of the Work Experience Report. Skillful application is the hallmark of quality engineering work. A candidate's experience shall include meaningful participation in several aspects 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.).

Part 2 – PRACTICAL EXPERIENCE

Practical experience provides the candidate with opportunities to become aware of the practical limitations of real systems. Exposure to practical experience should have added to the applicant's understanding of the limitations of real systems in these areas:

- 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.

Part 3 – MANAGEMENT OF ENGINEERING

Management of engineering works includes the supervision of staff, project management, a general exposure to an engineering business environment, and the management of technology from a societal perspective. Exposure to engineering management should have added to the applicant's understanding of the following:

- 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.

Part 4 – SOCIAL IMPLICATIONS OF ENGINEERING

The overriding objective of the “social implications of engineering” section is to demonstrate that the applicant has an awareness of 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 work environment should have provided realistic involvement for the candidate to heighten awareness of the potential consequences, both positive and negative, of projects worked on:

- 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.

Part 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.

COMPONENTS OF ACCEPTABLE GEOSCIENCE WORK EXPERIENCE

Part 1 – APPLICATION OF THE KNOWLEDGE OF GEOSCIENCE PRINCIPLES AND PRACTICE

Application of the knowledge of geoscience principles and practice is the most important work experience reporting area. The skillful application of geoscience knowledge is essential to earning professional registration. A candidate's experience shall include active and responsible participation in these five areas:

- a) geoscience training and familiarization;
- b) technical geoscience experience;
- c) development of geologic concepts (for example: preparation of reports concerning deposits of rocks, minerals or other naturally-occurring earth materials); and,
- d) mapping and systematic geoscience evaluation (with specific reference to bedrock, unconsolidated earth materials and/or snow, ice, groundwater, surface water and constituents thereof);
- e) identification of geologic hazards and risk to the public and the environment.

Part 2 – MANAGEMENT OF GEOSCIENCE

Management in geoscience includes the supervision of staff, project leadership, budgeting and the socially responsible application of geoscientific principles and practices. Candidates must be able to document reasonable progression toward increasing management involvement and responsibility over time.

Part 3 – SOCIAL IMPLICATIONS OF GEOSCIENCE

The practice of geoscience has significant impact on the public in the fields of public and environmental safety, industry, finance and education. Candidates should become aware of the geoscientist's role in society and the social impact of projects in which they are involved. They should understand the role of the geoscientist from these points of view including environmental, economic and the advancement of knowledge. The objective is to foster an awareness of the geoscientist's professional responsibility to guard against conditions which threaten life, property or the environment and to call such conditions to the attention of those responsible.

Part 4 – COMMUNICATION SKILLS

Developing and practicing communication skills is an essential experience requirement. Candidates are required to communicate effectively with superiors, co-workers, government regulators, clients and the general public. They should be proficient in the written and oral presentation of geoscience from daily record-keeping to major reports