Acceptable Engineering Work Experience

Work experience is an essential element in determining whether or not an individual is acceptable for professional registration/licensure. 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 broad areas of practical experience, management, communication, and the social, environmental and economic implications of engineering. Applicants should be familiar with the application of the APEGBC Sustainability Guidelines and Sustainability Primer to their work, and seek appropriate expertise as required. 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.

1. Application of Theory

The skilful 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

scope and operating conditions, feasibility assessment, safety issues, technology assessment, and assessment of individual and cumulative social, environmental and economic implications, etc.

b. Design and Synthesis

functionality or product specification, component selection, integration of components and subsystems into larger systems, reliability and maintenance factors, conservation of resources, human and environmental aspects, and the societal implications of the product or process, etc.

c. Testing Methods

devising testing methodology and techniques, functional specification verification, and new product or technology commissioning, assessment etc.; and

d. Implementation Methods

technology application, engineering cost studies, optimization techniques, process flow and time studies, quality assurance implementation, cost/benefit analysis, safety, environmental and social issues and recommendations, and maintenance and replacement evaluation including evaluation of long term and indirect consequences of materials choice and disposal, 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 operational, and maintenance circumstances;

b. application of equipment as part of the larger system, including, for example, the merits of reliability, the concept of sustainability, 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 and social systems in achieving desired goals, including limitations of production methods, manufacturing tolerances, performance minima, limitations of the ecosystem, and 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.

a. planning from conception through to implementation. This includes: needs assessment, concept development, assessment of alternative solutions and resources required, and assessment of social, environmental and economic impacts of project implementations;

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 the interaction with other projects and the marketplace;

c. budgeting, including the development of preliminary and detailed budgets, identifying labour, materials and overhead, indirect costs, risk analysis, lifecycle 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, direct and indirect consequences, and evaluation of societal and environmental impacts.

4. 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, as well as in stakeholder consultations;

c. making public presentations; ect.

5. Social Implications of Engineering

The overriding objective of the "social implications of engineering" requirements 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 ecosystem, 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 ensure intergenerational equity and methods of mitigating adverse impacts;

c. an understanding of the relationship between the engineering activity, external stakeholders and the public;

d. demonstrated interest and involvement in sustainability and 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.

6. Sponsorship

The Sustainability Committee have no comments on this section.

Acceptable Geoscience Work Experience

The following criteria are designed to provide guidance to candidates, employers and supervisors with respect to the level of experience expected of an applicant applying for professional registration or licensure.

1. Application of the Knowledge of Geoscience Principle and Practice

The skillful application of geoscience knowledge is essential to earning a professional registration or licensure. To be accepted, a candidate's experience must include active and responsible participation in several aspects of geoscience:

a. geoscience training and familiarization;

b. technical geoscience experience;

c. development of geological concepts: preparation of reports concerning deposits of rocks, minerals or other naturally-occurring earth materials;

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 geological hazards and risk to the public and environment;

f. analysis of the long term and short term, direct and indirect impacts of a project or process, including remediation and impact on future generations; and,

g. consideration of the social, environmental and economic implications of a project or process.

2. Management

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

3. Communication Skills

During the training period, GITs should be required to communicate effectively with superiors, co-workers, government regulators, clients, and the general public. They should become proficient in the written and oral presentation of geoscience from daily record-keeping to major reports to stakeholder consultations.

4. Social Implications of Geoscience

The practice of geoscience has significant impact on the public in the fields of public and environmental safety, industry, ecosystem integrity, finance and education. GITs should become aware of the PGeo'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. GITs should be familiar with the application of the APEGBC Sustainability Guidelines and Sustainability Primer to their work, and seek appropriate expertise as required. The objective is to foster an awareness of the geoscientist's professional responsibility to guard against conditions which threaten life, property or the ecosystem and to call such conditions to the attention of those responsible.

5. Sponsorship

The Sustainability Committee has no comments on this section.