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Note: This document was approved by the Board of Examiners in 2004 and revised on January 30, 2006

PEG Internship Guideline

Program Objective

The aim of the Internship Program is to ensure that candidates for membership gain experience that is rich and varied to allow them to progress to the level of maturity required to make reliable professional judgments. The internship period will provide the individual with the opportunity to develop and experience the following:

- a. Sound judgment in carrying out assigned responsibilities.
- b. An awareness of social and environmental impacts of his/her work.
- c. An understanding of the role of the Profession in society.
- d. Effective communication skills.
- e. An understanding of the limitations of own knowledge and the development of sound judgment about working within such limitations.
- f. Continuous enhancement of technical competence, organizational, personal, team, and business skills through continued professional development.
- g. The application of the Engineers and Geoscientists Act, Regulations, By-laws and Code of Ethics in a professional engineering/geoscience work environment.
- h. Participation in a self-regulated profession and an understanding of the issues around responsibility/accountability and liability.

Enrollment as a Member-in-Training for the duration of the period for which candidates are obtaining their post-graduation experience is the expected route to obtaining professional status.

1. ENROLLMENT AS A MEMBER-IN-TRAINING

Professional registration is available to individuals who have met the requirements in each of the following qualification areas:

- academic
- experience
- language qualification
- character
- professional practice and ethics
- continuing professional development

An applicant who meets the academic requirements for registration but has not met the work experience requirements may be registered as a Member-in-Training (MIT) in one of two categories: Engineer-in-Training or Geoscientist-in-Training.

Upon registration as a MIT, that person is required to comply with the structured Internship Program. The Internship Program helps candidates for membership gain experience that is compatible with the Internship Guideline to allow them to progress to the level of maturity required to make reliable professional judgments.

2. SATISFACTORY WORK EXPERIENCE

A period of supervised engineering or geoscience experience serves as an internship for individuals who are academically qualified and may subsequently apply for professional registration. During that period, such individuals are expected to be enrolled with PEG or with one of the other provincial/territorial associations and participate in the appropriate structured Internship Program. The profession, as represented by practicing Professional Engineers and Geoscientists and their employers, has the obligation to ensure that prospective Professional Engineers and Professional Geoscientists are provided with the opportunity to enter full professional practice, all the while maintaining professional responsibility and safeguarding the public interests.

The Board of Examiners or its designate examines the nature, quality, duration and currency of the candidate's experience and evaluates these against the criteria presented below. The profession relies heavily on the individuals and firms that provide the experience opportunities, serve as supervisors and mentors, and act as referees in the registration process.

2.1 Engineering and Geoscience Experience Qualification Requirements

Work experience is an essential element in determining whether or not an individual is acceptable for professional licensure. The responsibility for providing the proper environment, opportunities, range and progression of activities necessary to meet the work experience requirements rests with the applicant and the employer,

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as well as the individuals who provide supervision during the internship period.

Acceptable engineering/geoscience work experience must include:

- a. Application of theory.
- b. Practical experience.
- c. Management skills.
- d. Communication skills.
- e. Social implications of engineering/geoscience.
- f. Continuing professional development.

The professions under PEG's jurisdiction are technical. To demonstrate technical proficiency, one must show evidence of having spent a significant amount of time on the application of technical theory and on practical experience. If there is evidence of applying the scientific principles learned, then the Board will find the technical elements of experience to be acceptable. Of course, technical experience must meet Canadian standards.

Management skills, oral and written communication skills, and an understanding of the societal implications of a person's work are also integral to the learning experience. These last three components will take on a much greater significance as a career develops.

Each of the above six components has sub-components as detailed below. Some sub-components must be evident in your experience, while others are desirable but not mandatory.

2.1 a) Application of Theory

I ENGINEERING

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:

i. Analysis

For example: scope and operating conditions, feasibility assessment, safety and environmental issues, technology assessment, and economic assessment, etc.;

ii. Design and synthesis

For example: functionality or product specification, component selection, integration of components and sub-systems into larger systems, reliability and maintenance factors, human and environmental aspects, and the societal implications of the product or process, etc.;

iii. Testing methods

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

iv. 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.

The application of theory MUST include:

- selecting solutions and solving problems;
- preparing and checking designs or interpretations;
- showing evidence of sound technical judgment and practices; and,
- showing familiarity with the use and application of pertinent technologies, procedures, systems and programs.

It MAY also include the collection and analysis of information and data. However, data collection and analysis should not be the major component of assigned tasks for a significant period of time.

II GEOSCIENCE

The integration of geoscientific facts and principles into a comprehensive analysis of the situation is the objective of all geoscientific investigations. A candidate must be able to demonstrate, through experience, involvement in several aspects of the following:

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- i. design and implementation of geoscientific programs in which the objectives are enunciated in terms of clear instructions and procedures;
- ii. compilation and processing of data acquired both under the candidate's supervision and by others;
- iii. assessment and interpretation of geoscientific data in accordance with geoscientific principles and with due regard for the inherent uncertainties and ambiguities in the data. The candidate must recognize the possibility of alternate interpretations; and,
- iv. writing of technical reports presenting the conclusions in clear, concise form.

2.1 b) Practical Experience

I ENGINEERING:

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

- i. Site visits to existing engineering works, with opportunities to see equipment and systems in both operational and maintenance circumstances;
- ii. Application of equipment as part of the larger system, including, for example, the merits of reliability, the role of components in the system, and understanding the end product or engineering work in relationship to the equipment;
- iii. 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,
- iv. Opportunities to experience the significance of time in the engineering process, including workflow, scheduling, equipment wear-out and replacement scheduling, etc.

II GEOSCIENCE

Practical experience should provide the candidate with the opportunities to become aware of the practical limitations of real systems. Practical experience should include components such as:

- i. participation in field data collection to understand the techniques and field setting;
- ii. application of data and sample compilation and processing techniques;
- iii. opportunities to experience and understand the limitations and uncertainty associated with geoscientific data and its application to the understanding of the physical environment;
- iv. understanding of the socio-economic uses of the data and its interpretations; and,
- v. opportunity to experience the impact of time on geoscientific processes, the evaluation of data with time, the importance of scheduling, and the impact of the natural environment on schedules.

2.1 c) Management

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

Management includes:

- i. 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;
- ii. 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;

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iii. Budgeting, including the development of preliminary and detailed budgets, identifying labour, materials and overhead, risk analysis, life-cycle analysis, and tracking;

iv. Supervision, including leadership, professional conduct, organization of human resources, team building, and management of technology;

v. Project control, including co-ordination of work phases, tracking and monitoring costs and progress, and implementing changes to reflect actual progress and needs; and,

vi. Risk-analysis related to operating equipment and system performance, product performance evaluation, and evaluation of societal and environmental impacts.

The development of management skills MUST include involvement in:

- managing personnel and project resources;
- planning, scheduling, budgeting, and cost control;
- developing team skills, understanding, professional and business ethics; and,
- keeping appropriate records.

Experience MAY also include developing an understanding of corporate structure, legal aspects of contracts, quality assurance programs, and cost impact studies.

2.1 d) 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:

i. preparation of written work, including day-to-day correspondence, record-keeping, and report writing;

ii. making oral reports or presentations to colleagues, supervisors, senior management, and an exposure to, or

participation in, reports to clients and regulators; and,

iii. making public presentations.

The development of good oral and written communication skills is essential for all professionals.

Experience MUST show evidence of the preparation of written technical reports and of making oral presentations to management, peers, or the public.

2.1 e) Social Implications

The overriding objective of the "social implications of engineering/geoscience" requirement is to provide experiences which increase awareness of the professional's responsibility to guard against conditions which are 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/geoscience are an important aspect of the professional practice. The work environment should provide opportunities for applicants to heighten their awareness of the potential consequences of their work. This should include:

i. a recognition of the value and benefits of the engineering/geoscience work to the public;

ii. an understanding of the safeguards required to protect the public and methods of mitigating adverse impacts;

iii. an understanding of the relationship between the activity and the public;

iv. a demonstrated interest and involvement in the broader social implications of engineering and geoscience;

v. an appreciation of the role of regulatory bodies on the practice of engineering and geoscience;

vi. an understanding of the provincial health and safety of the workplace legislation; and,

vii. an understanding of the work's implications.

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Interaction between the professions and society is of significant importance. Experience MUST show evidence that an applicant is acquainted with such matters as safeguards and benefits to the public, and the roles and responsibilities of regulators in the specific field of professional practice.

2.1 f) Continuing Professional Development

Members-in-Training are required to comply with PEG's Guideline for Professional Development. This Guideline and the reporting forms are accessible in electronic format through the website at www.pegnl.ca. Paper copies will be provided upon request. It is the responsibility of the MIT to become familiar with the guideline and to submit his/her Member Profile Forms upon enrollment as a Member-in-Training.

The PD Plan and report forms are required to be submitted annually prior to the end of January of each calendar year.

The requirements for "Practicing Members" under this Guideline on Professional Development are different from the requirements for Non-Practicing Members. MIT's are expected to meet the same requirements as Practicing Members.

3. LENGTH AND CURRENCY OF EXPERIENCE

There is a requirement that an applicant normally obtain at least four years of acceptable work experience prior to becoming registered as a professional member.

It is the responsibility of the Member-in-Training to apply for professional status when he/she feels that the work experience requirement has been met. The Board of Examiners will assess at that time whether the candidate has obtained the full breadth of work experience.

Although a person cannot be enrolled as a Member-in-Training prior to graduation, those applying for pre-graduation experience credit (maximum of one year) are expected to comply with the Internship Guideline for documentation of such experience.

At least one year of the experience requirement should be acquired in a Canadian environment. An exception on Canadian experience may be made when the Board of Examiners approves the applicant's practice in accordance with PEG's policy on collaboration agreements. The Board of Examiners will assess this requirement on a case-by-case basis.

Engineering or geoscience experience should be compatible with the candidate's particular area of academic qualification. Additional requirements may be imposed if there is significant inconsistency between the academic and experience qualifications. For example, if the applicant's experience is in a discipline different from the degree (e.g. a mechanical engineering graduate who is working in the petroleum engineering field), the Board may require the applicant to obtain additional experience beyond the four year requirement to ensure that the experience is equivalent to that of someone working within the specialty of their degree.

Up to maximum of one year of pre-academic qualification experience may be accepted, if it is supervised by a professional engineer/geoscientist (or foreign equivalent), and if it otherwise satisfies the criteria of satisfactory work experience as outlined in this guideline.

The following conditions apply:

- for graduates of CEAB-accredited programs, the pre-graduation experience must have been obtained following the completion of at least one-half of the undergraduate program;
- for examination candidates, the pre-academic qualification experience must have been obtained following the completion of at least one-half of the examinations assigned;

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- for list and non-list confirmatory examination candidates, the pre-academic qualification experience must have been obtained following the completion of at least one-half of the undergraduate program; and,
- for technologists who subsequently obtain engineering/geoscience degrees, some experience obtained prior to academic qualification may be credited *but will not typically exceed one year.*

Candidates who have completed a master's or doctor's degree in engineering/geoscience MAY be given one-half credit for the time taken in earning the degree up to a maximum of one year for a master's degree and one additional year for a doctor's degree. The Board will make a specific determination on the quantity of credit to be granted based on an evaluation of the research and work project components of the program(s). The total of pre-graduation experience credit and post-graduate education credit towards experience shall not exceed two years.

4. SUPERVISION & MENTORING

The internship is a period of time when the work of the member-in-training is supervised and guided by another professional member who also fulfills the role of a mentor. It is preferable that an engineer-in-training be supervised by a professional engineer and that a geoscientist-in-training be supervised by a professional geoscientist.

Candidates who are not being supervised by a professional engineer or a professional geoscientist respectively, must advise PEG immediately so that various options, including the assignment of an off-site Mentor, may be discussed.

When the work experience is being gained outside Canada, and the supervisor is not a Professional Engineer or Professional Geoscientist, it is expected that, at minimum, the supervisor be educated as an engineer or geoscientist and have significant work experience in practicing engineering or geoscience which can be demonstrated through presentation of their resume or

curricula vitae. The applicant will be expected to provide such documents for inspection by the Board of Examiners in order for the Board to determine acceptability of this individual to fulfill the role of mentor.

Students on workterms not under the direct supervision of a professional engineer/geoscientist may request that an off-site mentor be assigned to supervise their work experience, as is the case with a MIT. The co-op workterm co-ordinator from the educational institution would not normally fulfill this role.

4.1 The Employer and Supervisor

Because this Internship Guideline has significance for the employers, supervisors and mentors of engineering and geoscience applicants, it is incumbent upon the Member-in-Training to ensure that all of these individuals are informed about the internship program and the associated roles and responsibilities as outlined in this guideline.

The components of satisfactory work experience are outlined in Section 2 of this guideline. The supervisor should assess the quality of the MIT's work on a regular basis and certify the documentation of the work experience (i.e. log book entries) prepared by the MIT for the purpose of obtaining professional status.

The employer/supervisor also performs the role of a mentor which includes the following:

- i. Counseling the MIT with the appropriate approach to technical problems;
- ii. Coaching the MIT and providing opportunities for him/her to obtain the breadth of experience required to obtain professional status;
- iii. Providing opportunities for work experience which is progressive in nature; and,
- iv. Providing guidance on matters of professional conduct and ethics.

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4.2 The Mentor

The role of the Mentor is to assess the quality of the MIT's work experience in light of the criteria contained in this guideline under Section 2: Satisfactory Work Experience.

Generally, the term "Mentor" for the purpose of this section refers to an off-site mentor who has been approved by the Board of Examiners to perform this function in the absence of an employer/supervisor who is a professional member. The mentor should preferably be of the same discipline as the MIT; however, exceptions may be made where necessary.

The role of the MIT in this process is:

- i. To propose a mentor who will be able to provide suitable guidance and request that PEG approve admission into the Mentorship Program;
- ii. To seek the support of the employer; and,
- iii. To meet with the mentor at least quarterly, commencing immediately following approval.

The duties and responsibilities of the Employer in this process are:

- i. To support the MIT in the Mentorship Program by providing the Mentor access to the MIT's workplace and any information required to assess the MIT's work;
- ii. To ensure that the services of a Professional Engineer/Professional Geoscientist are available as and when required to provide appropriate supervision of the MIT's work in accordance with the Application of Theory components of satisfactory work experience outlined in this guideline; and,
- iii. Review and initial log book entries as verification of the MIT's activities.

The duties and responsibilities of the Mentor are:

- i. To meet with the MIT immediately after appointment and at least quarterly thereafter;
- ii. To counsel the MIT with the appropriate approach to technical problems;
- iii. To review the work of the MIT and assess for suitability and sufficiency of engineering/geoscience content;
- iv. To bring to the attention of the MIT and the Registrar if suitable engineering/geoscience content is not being achieved;
- v. To assess professional conduct and ability in a progressive manner;
- vi. To report progress to PEG at least every six months on forms provided by PEG; and,
- vii. To review the MIT's log book.

5. DOCUMENTATION

An applicant for professional status must provide detailed information on their work experience in order to demonstrate to the Board of Examiners that the work experience demonstrates compliance with the criteria for satisfactory experience outlined in Section 2 of this guideline and evidence of increasing levels of responsibility.

PEG provides a log book specifically designed for this purpose and it is the responsibility of the MIT to present their work experience in a manner acceptable to PEG's Board of Examiners. Alternatively, forms may be accessed and completed in electronic format. Forms completed electronically will require the signature of the supervisor/mentor prior to being submitted to PEG.

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The log book is provided for the purpose of keeping a chronological written record of work experience and professional development required to gain professional registration. All engineers-in-training and geoscientists-in-training will be required to maintain a record for the full period of required experience.

Entries should outline all professional and non-professional work-related activities to provide a complete history. The candidate's personal responsibilities should be clearly documented. Entries should be made bi-weekly or *at least* monthly. Supervisor(s) for the period must be identified and asked to initial each entry as correct.

Professional development activities such as courses, seminars and involvement with technical societies or group study should be recorded.

PEG recognizes that an employer may not wish to have certain information of a sensitive or proprietary nature entered in the log book. Candidates should make themselves aware of such restrictions before recording entries.

In addition to the log book or forms, a summary report form will be prepared by the MIT which summarizes their work experience under each of the categories that constitute acceptable work experience (i.e. Application of Theory; Practical Experience; Management; Communication Skills; Social Implications of Engineering/Geoscience; and Continuing Professional Development). This form is available on the PEG website and may be completed electronically.

The log book or forms, along with the summary report form, will be presented for review prior to the mid-term interview and again upon application for professional status.

6. THE PROFESSIONAL INTERVIEW

The MIT will be contacted by PEG for an interview at approximately the mid-point of the internship period.

The main objective will be to review the progress of the MIT and provide helpful advice and guidance on whether the experience gained offers appropriate preparation for professional registration both in technical content and progression of responsibility. The interview is not to evaluate the degree of technical competence being achieved as this is done by the Board of Examiners when the MIT is evaluated for professional status.

An important aspect of the interview is to assist the applicant in determining if the MIT's work environment is providing the opportunities necessary to gain qualifying experience in accordance with the Internship Guideline. As noted under Section 5, the log book or forms and the summary report form will be reviewed in the interview.

A follow-up interview may be recommended if the interviewers feel that the applicant may need additional guidance and feedback in order to progress towards professional registration.

Normally, there will be two interviewers. At least one interviewer shall be from the discipline of the applicant or a closely-related discipline. Interviews will be arranged by PEG staff.

7. PROFESSIONAL PRACTICE AND ETHICS EXAMINATION

Applicants for licensure are required to pass an examination to confirm that they have sufficient knowledge of the ethical considerations and obligations that accompany the privileges of professional status, and the legal concepts relevant to professional engineering/geoscience practice. This examination is called the Professional Practice & Ethics examination (PPE).

The PPE is administered by PEG four times each year: January, April, July and October. A preparatory seminar is also offered in conjunction with each examination sitting. Study reference materials for this examination may be provided by PEG upon registration for the examination.

Effective 2004

APPENDIX

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2. Practical Experience allows applicants to understand the practical limitations of real systems. During the period, I obtained the following practical experience:

Description: _____

3. Management of Engineering/Geoscience works includes the supervision of staff, project management, general exposure to an engineering/geoscience business environment and the management of technology. During the period, I obtained the following experience in the management of engineering/geoscience:

Description: _____

4. Communications Skills includes development of good oral and written communication skills and applicants must show evidence of preparation of written technical reports and of making oral presentations to management, peers, or the public. During the period, I obtained the following experience in development of communication skills:

Description: _____

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5. Social Implications of engineering/geoscience work recognizes the responsibility to consider consequences of the work on public safety and the environment. During this period, the following heightened my awareness of the social implications of engineering/geoscience:

Description: _____

6. Continuing Professional Development: During this period, I have undertaken the following continuing education or continuing professional development activities to enhance my knowledge or skills in my area of practice:

Description: _____

Signature: _____ Date: _____

Please note that blank forms are available on the PEG website at www.pegnl.ca

