Guideline for Professional Practice

V1.1

January 2006

The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

FOREWORD

This publication is an update of the document entitled *Professional Practice – A Guideline* originally issued in September 1994. The guideline was revised to update certain elements and to have it conform to the current style for APEGGA's guidelines and practice standards.

An APEGGA guideline presents procedures and practices that are recommended by APEGGA. In general, an APEGGA member should conform to the recommendations in order to be practicing in accordance with what is deemed to be acceptable practice. Variations may be made to accommodate special circumstances if they do not detract from the intent of the guideline.

Guidelines use the word should to indicate that among several possibilities, one is recommended as particularly suitable without necessarily mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain course of action is disapproved of but not prohibited (*should* equals *is recommended that).* The word *shall* is used to indicate requirements that must be followed *(shall* equals *is required to).* The word may is used to indicate a course of action permissible within the limits of the guideline *(may* equals *is permitted).*

PARTICIPANTS

APEGGA's Practice Standards Committee (PSC) publishes practice standards and guidelines to promote high levels of professional service. The subcommittee of the PSC that developed the original guideline included the following members:

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- Human Resources Management,
- Professional Development,
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- Financial Management,
- Marketing Practices, and
- Electronic Resources Management.

ASFE

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ASCE - American Society of Civil Engineers

The objective of the ASCE Peer Review for Public Agencies Program is to give public sector engineering, construction, and operations agencies a means to improve the management and quality of their services and thus better protect the public health and safety with which they are entrusted. Peer review is applicable to public agencies of any size, mission, discipline, responsibility, or location that provide an engineered product.

The program covers the following areas:

- Organizational Management
- Project Management
- Emergency Management Procedures
- Technical Practice and Procedures
- Human Resource Management
- Financial Management
- Public Relations Practices

The cost of a peer review depends on the number of staff that the agency employs. The staff size, in turn, determines the number of days of the peer review and the size of the peer review team. The fee ranges from $5,000 to $15,000 US.

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1 OVERVIEW

Alberta's *Engineering, Geological and Geophysical Professions Act* (the *Act*) gives the professions the privilege of self-governance because it is deemed to be in the public interest to do so. That privilege carries with it the obligation to ensure that members of the professions maintain high standards of professional practice. The driving consideration has always been the safety and welfare of the public. Accordingly, members are expected to conduct themselves in a manner that:

- is in the best interests of the public,
- is in accordance with the *Code of Ethics*,
- maintains or improves the standing of the professions generally, and
- demonstrates knowledge, skill and judgment in the practice of the professions.

Further discussion of the professions and professionalism may be found in the APEGGA publications *Concepts of Professionalism* and *The Practice of the Professions of Geology and Geophysics* which are available on APEGGA's Web site at *www.apegga.org .*

The terms "a professional practice" and "the professional practice" are used throughout this guideline. They mean the practice of engineering, geology or geophysics performed by an individual practitioner or an organization. Consulting, service and operating companies are included. References to "client" include clients who may be internal or external to the organization.

1.1 SCOPE

This guideline addresses the following subjects:

- It clarifies roles and responsibilities. The guideline provides an overview of the primary roles and responsibilities of APEGGA and its members.
- It addresses the application of quality management concepts to the professional practice. The guideline provides a quality management framework for effective management of a professional practice.
- It introduces the concept of peer review. Peer review is a process that can be used by a professional practice to assess its performance and identify areas where improvements could be made. It can focus on assessing business, technical and/or professional practices, and so is of interest to APEGGA members and permit holders.

The *Act* does not distinguish between practice as a consultant and practice within an operating company. The *Act* and the guideline apply to all forms of professional practice.

1.2 PURPOSE

This guideline was created to assist individuals and organizations with developing and maintaining appropriate standards of practice. It is intended to complement, rather than replace or supersede, other APEGGA documents. Its interpretation and application will vary based on the size and nature of each professional practice. The guideline is presented in that context.

- Frequency of Review
  Reviews should be undertaken at intervals appropriate to the organization, preferably not exceeding five years. This will allow the organization to realize some measure of success from its follow-up action of previous reviews and will maintain an awareness of areas where improvements can be achieved.

4.3 SUMMARY OF PEER REVIEW PROGRAMS

The following is a summary and description of available peer review programs. A review is conducted at the specific request of the organization that wishes to obtain a confidential evaluation of its practice.

ACEC - American Council of Engineering Companies

In 1984, ACEC developed a program that would give design firms the ability to evaluate the effectiveness of their own practices and procedures. The areas covered by the program include:

- Computer Systems Management
- General Management
- Human Resources and Professional Development
- Financial Management
- Project Management
- Business Development
- Quality Management

The Peer Review Program is backed by many liability insurance agencies. Costs associated with a peer review consist of a reviewer's honorarium, an ACEC administrative fee and the travel expenses for the reviewers. Reviews can be requested by ACEC-member firms and non-member firms.

ACEC Peer Review Program
1015 - 15th Street, NW, 8th Floor
Washington, DC 20005
Phone: 202-347-7474
Fax: 202-682-4361

ASFE

ASFE member firms provide a wide array of "earth engineering" and related applied science services, e.g., geoprofessional, environmental, civil engineering, biological, ecological, archeological, infrastructure security, brownfields revitalization, construction management, and construction materials engineering and testing services, among others.

The stated purpose of ASFE's peer review program is to evaluate policies that affect the quality of the firm's services, assess the extent to which those policies are followed, identify opportunities for improvement, and identify specific methods to achieve improvement in the following areas:

- Business Management,
- Facilities and Technical Resources,

- A peer review addresses the organization as opposed to the individuals making up the organization.
- A peer review is intended to produce results.

A peer review can be conducted as an internal procedure utilizing staff from other parts of the organization. Beyond these internal reviews, however, occasional external reviews are encouraged.

4.2 KEY ELEMENTS OF A PEER REVIEW

The following is a summary of the key elements of a peer review that are relevant to a professional practice in reviewing its operation.

- Commissioning Authority
  The commissioning authority for the peer review will normally be the professional practice wishing to be reviewed.
- Breadth of Practice Reviewed
  Organizations are encouraged to conduct peer reviews on the portions of the organization involved in professional practice. Peer review can also be extended to cover other aspects of the organization's business.
- Standards for Comparison
  The APEGGA *Code of Ethics*, the guidelines outlined in this and other APEGGA guidelines and other well-recognized industry standards are intended to represent the standards for comparison.
- Selection and Qualifications of Peer Review Team
  Selection of the peer review team is normally the responsibility of the subject organization. Peer reviewers should be trained and registered, where appropriate, with the peer review program that they are working under. It is preferable that peer reviewers be APEGGA members who are familiar with requirements of the professions in Alberta. If reviewers come from other jurisdictions, they should be qualified professional engineers, geologists or geophysicists.
- Extent of Organization To Be Reviewed
  Many organizations have several offices. The peer review should achieve broad coverage. If all offices cannot be reviewed, a sampling of each type and size of office should be included in the review in order for the organization to appreciate the unique problems associated with each.
- Reports and Records
  The findings should be reported in confidence to the commissioning authority and a record maintained for future follow-up. Some existing programs are based on the provision of a verbal report by the reviewers. Therefore, a record of the report may be the responsibility of the commissioning authority.
- Follow-up Action
  The success of the peer review is entirely dependent on the follow-up action taken by the organization. The first step should be a prioritization of issues requiring follow-up and the development of a plan to address them. Action plans should be communicated to staff as appropriate.

1.3 DEFINITIONS

For the purposes of this standard, the following terms and definitions apply.

A/the professional practice
The practice of engineering, geology or geophysics that is performed by an individual or a permit holder registered with APEGGA.

Act
The *Engineering, Geological and Geophysical Professions Act*.

Member(s)
Individual persons or permit holders registered under the *Act.*

Permit holder
A partnership or other association of persons or a corporation that holds a permit to practice engineering, geology or geophysics under the *Act.*

Regulations
The *General Regulation* governing the professions of engineering, geology and geophysics under the *Act.*

2 ROLES AND RESPONSIBILITIES

2.1 THE ENGINEERING, GEOLOGICAL AND GEOPHYSICAL PROFESSIONS ACT

The *Act* governs the practice of engineering, geology and geophysics in Alberta and deals with the following matters:

- scope of practice of the professions
- APEGGA's powers and operation
- the making of regulations and bylaws
- registration of individuals and organizations
- discipline
- registered professional technologists
- practice prohibitions and penalties

The definitions of the practices of engineering, geology and geophysics are set out in the *Act.*

2.2 APEGGA'S ROLE

APEGGA regulates the professions of engineering, geology and geophysicists in the Province of Alberta by administering the *Engineering, Geological and Geophysical Professions Act,* the *General Regulation* under the *Act,* and its own *By-Laws.*

APEGGA's Council can make regulations and bylaws in accordance with the Act, in a large number of areas, including, for example:

- categories of membership
- academic qualifications and experience requirements for registration
- technical standards of practice for the professions
- a *Code of Ethics*

- a compulsory continuing education program
- functions, duties and operation of boards and committees
- use of professional stamps, seals and permit numbers
- the operation of permit holders
- administrative bylaws concerning APEGGA's operation.

The *Act* requires that there be an Investigative Committee to investigate complaints about the conduct of a member and a Discipline Committee to decide whether a member's conduct constitutes unskilled practice or unprofessional conduct and to order sanctions against the member if appropriate. The following definitions are used in the discipline process:

- Unskilled practice of the professions is practice by an APEGGA member which is deemed by the member's peers to be below the acceptable standards of practice either in technical competence or in the overall performance of the scope of services undertaken.

- Unprofessional conduct is conduct by an APEGGA member which is in violation of the *Code of Ethics* or which is otherwise inappropriate, regardless of whether or not the conduct arises within the member's professional practice.

APEGGA has published several guidelines and practice standards that deal with various aspects of professional practice. A complete list is provided on APEGGA's Web site.

2.3 APEGGA MEMBERS' RESPONSIBILITIES

Members are accountable for their professions generally, their own professional practices and for the practice of individuals under their supervision. In addition to preserving ethical standards, members are responsible for ensuring that they, and those under their supervision or control, maintain appropriate levels of competency.

APEGGA members are responsible for practicing in a professional manner -- ethically, competently and in compliance with the *Act.* Permit holders are further obligated to provide an environment which ensures that appropriate standards of professional conduct and technical competency are maintained and which supports professional employees in discharging their legal and ethical duties under the *Act.*

The obligation of APEGGA members to practice in an ethical manner is defined in the *Code of Ethics*. The Code defines a standard of professional conduct expected of members. It consists of a preamble, which provides brief statements of ethical principles, and five enforceable Rules of Conduct. The Rules deal with the following matters:

1. health, safety and welfare of the public and regard for the environment,
2. competence and knowledge,
3. integrity, honesty, fairness and objectivity,
4. compliance with statues, regulations and bylaws,
5. honour, dignity and reputation of the professions.

The *Guideline for Ethical Practice* provides an amplification and interpretation of the *Code of Ethics,* complete with illustrative case studies.

- Professional responsibility - ensuring that the work is carried out by appropriately qualified professionals. This would include items such as establishing clear lines of professional responsibility, assignment of appropriately skilled staff and continuing competence of professionals.

- Quality assurance - ensuring that appropriate technical standards are maintained. This would include items appropriate and applicable to the specific practice of the organization. Items which might be addressed include definition of project scope and objectives, conceptual review of designs, use of codes and standards, checking of designs, calculations, drawings and reports, management of design changes, and field and shop reviews during construction.

- Records management and document control - ensuring that appropriate and sufficient records are kept and available.

- Communication and control - Policies that ensure that the PPMP is understood and followed throughout the organization.

PPMPs will vary considerably in complexity, degree of detail and specific content depending on the size and nature of the professional practice. Consulting and operating companies will have very different needs. The PPMP should address the specific needs of the organization and be as simple or complex as the organization requires.

A PPMP need not duplicate existing documentation. Supporting and/or more detailed documentation may be incorporated by reference and need not be rewritten or summarized for inclusion in the PPMP.

Further information on developing PPMPs is available in APEGGA's *Guideline for Professional Practice Management Plans.*

4 PEER REVIEW

Peer review is a process used by organizations and individuals to assess their performance and identify potential improvements in their professional practices.

4.1 CHARACTERISTICS OF PEER REVIEWS

The peer review process is best defined by the following outline of distinguishing characteristics:

- A peer review is conducted by peers. A peer is generally defined as a person or group with a similar level of technical or managerial expertise to that of the party being reviewed.
- Peers are independent of the subject of the review.
- A peer review is a special effort, not a routine process.
- A peer review has a specified purpose, scope, format and duration.
- Peer review includes a commissioning, a beginning, a report, an end and decommissioning.
- A peer review is paid for by the commissioning authority that benefits from the review.

specifications are being used or issued. A policy that sets out file backup and archival requirements should be in place.

3.4.4 Cost Estimation and Control

The project plan should identify a target cost or budget. The ability to estimate and track costs is essential to effective project management. Procedures for preparing cost estimates and tracking expenditure commitments should be established.

3.4.5 Preparing Tender and Contract Documents

Standard policies and procedures should be established for preparing tender and contract documents. A system for control of tender documents and handling addenda during tendering should be included. Project management staff should be trained in presiding at tender openings, evaluating tenders and recommending contract awards.

Standard company contract forms and general conditions of contract should be subject to professional and legal reviews on a regular basis. Personnel should understand the organization's role and responsibilities within the context of these documents.

3.4.6 Construction Management and Review

Professional practices involved in project management are encouraged to include construction observation in their scope of work. The objective is to ensure effective communication of the design to the construction contractor. Communication procedures should be established for the construction period. Systems should be in place for handling change requests, change orders, progress payment processing, shop drawing reviews and other documentation.

Project managers should review field reports promptly and follow up as required. Field personnel should be given clear lines of responsibility, authority and reporting expectations. Disputes should be acted on immediately. Dispute resolution is discussed in APEGGA's guideline on risk management

3.4.7 Project Close-Out

Complete documentation of original design, change orders, project history and as-built drawings is essential. Standard policies and procedures should be established for closing out projects. These procedures should include archiving requirements, close-out communications, sign-off requirements and final project evaluation.

3.5 THE PROFESSIONAL PRACTICE MANAGEMENT PLAN

Development and implementation of a Professional Practice Management Plan (PPMP) is an effective way to address quality management issues. A PPMP is a written description of corporate policies, procedures and systems used to ensure that appropriate standards of practice are maintained. The *Regulations* require that each permit holder "has in place and will follow a practice management plan that is appropriate to its professional practice." As a minimum, a PPMP would address the following items:

- Ethical standards - ensuring that professional practice is carried out in accordance with the *Code of Ethics*.

3 QUALITY MANAGEMENT AND THE PROFESSIONAL PRACTICE

In the context of a member's professional practice, quality management is concerned with the following:

- providing conditions conducive to practicing professionally,
- maintaining a level of technical competency commensurate with the professional service being performed,
- providing assurance that work is done competently and with due diligence,
- coordinating the efforts of project teams, and
- ensuring that appropriate and sufficient records are kept.

This section deals with quality management issues which impact the ability of a professional practice to act professionally and maintain appropriate quality standards. A professional practice should give consideration to these issues in planning for effective practice management. The principles discussed apply to all members engaged in professional practice, whether they are individuals or organizations.

3.1 MANAGEMENT OF A PROFESSIONAL PRACTICE

The management of a professional practice affects the ability of the organization and its staff to meet its professional obligations. Some of the key factors in effective management of a professional practice are discussed below.

3.1.1 Purpose

The Statement of Purpose or Mission Statement of the professional practice defines its corporate philosophy and long range objectives. It establishes a sense of responsibility to employees, clients and the public. This statement restricts the scope of practice to areas of competence and becomes the central focus for future planning. The statement of purpose should have the support of, and be communicated to, employees at all organizational levels.

3.1.2 Strategic Planning

The professional practice should have a corporate strategy -- the pattern of objectives, purposes, goals and major policies stated so as to define the business of the professional practice and the kind of practice it is or is to be.

Strategic planning provides support for the professional practice, a strategy describing where it plans to be in the future -- targets, goals or objectives, -- and a plan of how it intends to accomplish its goals. The formulation of strategy should balance both internal and external factors:

- internally -- the strengths and weaknesses of the professional practice and the personal values of its key personnel, and
- externally -- the opportunities in the industrial environment and the broader societal expectations of the professional practice.

With a strategic plan, overall strategy and purpose impact decision making at all levels and in all functions. The plan should be communicated with clarity so as to influence action throughout the professional practice.

3.1.3 Organizational Structure

A clearly defined organizational structure is essential for effective communication and control. Authority for operational decisions within the professional practice and special alternative organizational arrangements established for special projects should be clearly established.

3.1.4 Facilities, Resources, and Equipment

The professional practice should provide access to the appropriate tools to do the work effectively.

The work environment and technical support available have a direct influence on efficiency and ability to produce quality work. The quality of working conditions, facilities, equipment and technical resources all contribute to the professionalism, competence and trustworthiness of the practice.

The professional practice is responsible for providing ready access to current technical information. Procedures should be implemented to ensure that design codes, regulations, and other reference documents used by professionals are kept up to date.

3.1.5 Loss Control and Risk Management

Loss control is anything done to reduce personnel, material or financial loss. It includes the prevention of exposure to loss, the reduction of loss when loss-producing events occur, and the mitigation or reduction of risk.

Effective loss control requires a quality program which incorporates organizational, operational and public relations considerations. Support for the quality program should be evident in the way the professional practice organizes, selects staff and executes assignments. The professional practice should have an effective loss control program.

Risk management is a proactive approach focusing on losses before they occur and dealing with factors which can impose injury to personnel or cause a material loss. It addresses the facilities, procedures, practices and organizational strategies of the professional practice.

Risk management in a professional practice requires the consideration of many factors which may vary from one organization to another. Some of the primary concerns of risk management are:

- assessing the risk factors and potential liabilities associated with decisions, changes in procedures or new situations not covered by established procedures,
- funding the exposure to risk,
- establishing a risk management program, and
- practicing effective dispute resolution methods.

Risk management, loss control through quality management and dispute resolution are discussed from a professional practice point of view in APEGGA's guideline on risk management.

used in performing professional work, drawings, design calculations, shop drawings, reports and other communication documents.

3.4 PROJECT MANAGEMENT AND EXECUTION

Most activities conducted by a professional practice require some project management. Successful project management involves the establishment of systems which clearly define the organizational structure, lines of communication, project scope and quality management system, combined with provision of appropriate professional expertise. Key components in the management of a project include:

- definition of the assignment or project,
- development of work plan, budget and schedules,
- organization of the project team,
- implementation of the assignment,
- project close-out.

3.4.1 Project Planning

For each project, a plan should be developed to confirm project objectives and concepts, cost limitations, functional description, site data, code restrictions, time restrictions, project team composition and coordination of technical disciplines. Each project should establish a project organization which identifies personnel, lines of communication, and lines of authority. Each technical discipline should be led by a professional member with appropriate backup. All team members should clearly understand their roles and responsibilities for the project.

Project work plans should be documented in a form that can be used for tracking project progress and determining the impact of changes. A system should be in place to document and confirm all changes to schedule, cost and project scope.

3.4.2 Quality Control Procedures

Effective project management requires the establishment of quality standards and the processes to be used to ensure compliance. This should include identification of critical stages at which reviews and sign-offs are required and the follow-up to ensure that the reviews are undertaken. Effective quality assurance and control processes are particularly important in constructed projects.

Some clients may require that their standards be used. A senior professional should review the proposed standards and ensure that they conform to good professional practice.

3.4.3 Project Communications and Records

The project plan should emphasize the importance of accurate and well-documented communication. Regular meetings should be held. Procedures should be developed for recording all communications, including identifying when verbal communications will be confirmed in writing.

A document control and file management system should be in place to ensure that documentation is kept up to date and to facilitate retrieval of project information. Procedures should ensure that only current documents, reports, drawings and

- confirming that applicable codes, deed restrictions and jurisdictional constraints have been adhered to, and
- independent review of final deliverables and key intermediate documents, complete with back-checking to make sure that requested corrections have been completed.

Change control procedures should be established to ensure that changes to previously approved documents are fully reviewed for compliance with technical and design standards, and that any impact caused by these changes on other documentation is recognized and taken into account.

3.3.3 Use of Computers

Practice in engineering, geology and geophysics has become increasingly dependent on computers. Professionals should be mindful of the difficulties that can exist and exercise due diligence.

Computer software development is based upon many assumptions, judgments and interpretations that can lead to subtle limitations in computed results. The professional practice and its professional employees are responsible for verifying that the results obtained from computer software programs are accurate and acceptable. Where appropriate, new software releases should be verified against a standard and certified for general use.

All computer programs, and especially those generated internally, should be documented thoroughly as to assumptions, methods of operation and limitations. Appropriate file back-up procedures should be implemented. The firm should also ensure that all computer users are appropriately trained and have developed sufficient skill to use the equipment and software effectively.

Additional information can be found in APEGGA's guideline outlining the professional responsibilities for software development.

3.3.4 Quality during Construction

It is important, where possible, that the professional practice and individual professionals continue to be involved in their projects in the construction phase. Change orders and modifications to contracts should be properly documented, distributed and kept current.

Clear lines of responsibility and authority should be established for field personnel. Construction phase communications should conform to contractual obligations and responsibilities. Procedures should be established for accepting, reviewing, approving and returning shop drawings. Reviews by junior or inexperienced personnel should be monitored by senior professionals.

3.3.5 Communication and Records

Accurate and well-documented records of communications are important to any professional practice. Miscommunication can be costly, and in the worst case, place lives at risk. The professional practice should establish procedures for handling and documenting communications.

Accurate and complete records should be kept for all projects until the professional liability period expires. These records would include documentation of the methodology

3.1.6 Negotiating and Contracting Policies

For consultants, the business practices for negotiating and contracting professional services should conform to the standards of conduct required of APEGGA members and should also respect and complement the duties and ethics of other professionals.

The scope of assignment, the fee structure that reflects the services, and the quality of the completed work should all be established with care. The process of negotiations and contractual agreements should reflect public protection, satisfy client needs, and act in fairness and good faith towards others. APEGGA's guideline on establishing rate structures and developing contracts has further information on these subjects.

Consultants should avoid conflict of interest situations and should declare any existence of potential conflict to the affected parties for formal approval before continuing. The prime consultant should be responsible for engaging appropriately qualified subconsultants to respond to client needs. The roles between client and consultant should be clearly defined with respect to planning, financing, management and coordination of a project.

3.1.7 Human Resource Management

Professional staff are key contributors to the performance of a professional practice. Human resource management practices should be fair and equitable to encourage high levels of employee motivation and performance. A professional practice will benefit from having and demonstrating a commitment to the individual professional's career development. Such a commitment fosters employee motivation and morale, and so contributes to performance and productivity.

The primary responsibility for career development lies with the individual professional. Where the professional is employed by a firm which is large enough to allow for substantial advancement or capability development, it will be in the interest of both the firm and the individual to do joint planning for career development. Such plans would consider additional training requirements, new and challenging project assignments and provision of adequate leadership and mentoring.

The advancement of qualified staff to positions of greater responsibility demonstrates commitment to employee career development. Promotion from within should be encouraged, with exceptions made where the needs of the organization in experience, skill or knowledge cannot be met by current staff.

An effective performance management program is also a strong factor in maintaining employee motivation. Such a program should monitor performance against expectations in a fair, equitable and systematic manner. Feedback should be provided on a regular basis. Objective and open discussion of strengths and weaknesses, particularly with respect to technical competence, should be encouraged.

3.2 PROFESSIONAL COMPETENCE

A professional practice requires an effective program to ensure continuing competence of its professional staff. Such a program should go beyond technical knowledge and project execution skills; it should recognize and encourage characteristics such as integrity, ethics and reliability that are associated with professional responsibility.

3.2.1 Selection of Staff

Registration is required for all individuals engaging in the practice of engineering, geology and geophysics. The professional practice must make registration with APEGGA a condition of employment for those who will carry out professional assignments on behalf of the firm.

Professional competence should be the primary factor in selection of personnel for professional assignments. In addition, personnel selected for professional assignments should be fully qualified, with an established reputation for integrity, reliability and ethical practice.

Both the professional practice and its professional employees should ensure that any concerns about the individual professional's ability to handle an assignment are brought forward and resolved expeditiously. Where appropriate, employees should be encouraged to seek specialized advice from other staff in the professional practice or, if necessary, from outside the organization. Professionals-in-training should be recruited only for positions in which sufficient supervision and support are available to enable these employees to become qualified professionals.

3.2.2 Professional Development

A professional practice should ensure that each practicing staff member maintains technical competence in the areas in which professional services are performed. Staff members should be encouraged to participate in appropriate education and training programs, such as:

- formal training sessions conducted by the organization or by recognized outside organizations,
- informal on-the-job training under the guidance of qualified personnel,
- encouragement of informal information sharing between employees through workshops and networks.

Regardless of the degree of educational support provided by the firm, individual members are obligated to maintain their own technical competence in all areas in which they practice. In addition to informal and formal training programs, professionals should actively participate in appropriate professional and technical societies.

The *Regulations* require that each individual member comply with the requirements of the Continuing Professional Development Program, including undertaking appropriate professional development activities and reporting those activities as requested. Further information is available through the publication, *Continuing Professional Development Program*, available on APEGGA's web site.

3.2.3 Training in Current Codes and Standards

A professional practice should ensure that all practicing staff are trained in the use of current design codes, quality standards, applicable regulations and other relevant documents and techniques. Individual professionals have a complementary obligation to ensure that they, and those under their supervision, maintain appropriate levels of training and awareness of these codes and standards.

3.2.4 Communication and Teamwork Skills

Well-developed communication skills are key to maintaining effective communications with all stakeholders. Improvement in proficiency should be encouraged by the firm and actively pursued by the individual.

Teamwork among professionals is becoming increasingly important. Well-developed team-building and interpersonal skills are important to efficiency and effectiveness. Where appropriate, training in the principles and techniques of working in team situations should be obtained.

3.3 MANAGEMENT OF TECHNICAL QUALITY

Effective management of technical quality should be a primary goal of the practice. As a minimum standard, a professional practice should establish processes that ensure the following:

- technical work is carried out competently and in accordance with applicable codes and standards,
- appropriate independent checks of concepts, processes and procedures are carried out,
- qualified personnel conduct field reviews of projects during construction, and
- complete project files are retained in safekeeping until the liability period expires (currently ten years maximum under Alberta's Limitations Act).

3.3.1 Standards and Specifications

A professional practice will frequently find that certain aspects of its activities can be handled more effectively if some basic standards and specifications are defined and followed. The organization should ensure that:

- its standards and specifications comply with all applicable codes, regulations and external standards,
- standards are kept current,
- changes to standards are fully evaluated prior to acceptance,
- standards are well-documented and easily accessible,
- the use of the standards is clearly understood, and
- new employees are provided with appropriate training.

3.3.2 Quality Control Procedures

Effective procedures should be in place to ensure that an appropriate standard of technical quality is maintained. In any situation which can impact public safety, the professional practice should provide for independent confirmation of computations, reports, drawings and specifications, and ensure appropriate documentation of the results. This confirmation may come from within the organization, but it is preferable that there be no direct involvement of the "checkers" with the project being checked. Individual practitioners will also, at times, need outside verification of critical work.

The formal quality assurance process may involve:

- confirming concepts, technical calculations, analyses, drawings and report drafts for conformance to the firm's standards and to skilled practice,