Professional Practice and Ethics

ASTTBC Study Module

Introduction

The requirements for certification and registration as an ASTTBC technology professional (technologist, technician or registered technical specialist) include successfully completing a Professional Practice and Ethics (PPE) examination. The purpose of the exam is to confirm you are aware of the regulations and requirements to practise as a technology professional in British Columbia. This study module is designed to assist applicants prepare for the PPE examination by providing an overview of the essential elements of the ASTTBC Bylaws with particular emphasis on the Standards of Competence and Code of Ethics.

The study module consists of three parts:

- Part 1: Regulatory Framework
- Part 2: Professional Practice
- Part 3: Standards of Conduct and Code of Ethics

When you have completed the three parts of this study module and have read the supporting reference documents you will need to contact an ASTTBC Registration Coordinator to schedule a date and time to complete a two-hour online, open book exam. The online exam may be completed at home, at your workplace or at an exam center located throughout BC. During the exam, you may refer to the study module and any of the reference materials. The PPE exam consists of 60 questions of various types (multiple choice, true or false, matching). The pass mark is 80%. During the exam, you will be required to access the ASTTBC Standards of Competence and Code of Ethics referred to in this study module and available in Schedule D of the ASTTBC Bylaws. The two-hour time limit to complete the exam will make it very difficult for you to start searching for answers if you have not prepared in advance by studying this module and reading the reference materials.

Applicants that experience exam anxiety or have any other challenge with completing online exams should inform the registration coordinator when scheduling the exam.

Successfully completing the PPE exam is required before your application for registration is assessed.

This study module is based on the Professional Governance Act (PGA), general regulations and ASTTBC-specific regulations and ASTTBC Bylaws which constitute the legal framework from top level legislation through to standards of competence and conduct. All ASTTBC

registrants are required to comply with the rules set out in the legal framework and may face potential investigative and even disciplinary consequences should they fail to do so.

Part 1: Regulatory Framework

The Professional Governance Act

A significant change in the legal framework for technology professionals in British Columbia (BC) was initiated in November 2018, when the BC Legislative Assembly passed the third reading of the Professional Governance Act (PGA). The five organizations named in the PGA were:

1. Applied Science Technologists and Technicians of BC (ASTTBC)
2. Association of BC Forestry Professionals (ABCFP)
3. BC Institute of Agrologists (BCIA)
4. College of Applied Biology (CAB)
5. Engineers and Geoscientists of BC (EGBC)

The PGA established the Office of the Superintendent of Professional Governance within the BC Ministry of the Attorney General. The main purpose of establishing such an office was to better protect the public interest through the oversight of regulatory bodies in BC. In addition to prescribing the governance structure of the regulatory bodies, the PGA empowered the superintendent to establish guidelines in respect of one or more regulatory bodies relating to the governance of the regulatory body and relating to the following:

(i) the protection of the public interest;
(ii) bylaws made by the council;
(iii) the code of ethics or ethical principles;
(iv) standards of conduct and competence.

The PGA established a new, modernized framework for professional regulators in the natural and built environment. Included in this legislation are standards relating the governance of regulatory bodies, role of ASTTBC, setting out ethical principles and responsibilities of its registrants. ASTTBC registrants continue to be held to high standards of conduct and competence and have many other duties as specified in the PGA including a duty to report sub-standard practice or conduct that is not becoming of a professional.

On February 5, 2021, the Applied Science Technologists and Technicians of British Columbia (ASTTBC) transitioned to become a regulatory body under the PGA. Changing to the new PGA after 36 years operating under the ASTT Act required new regulations and bylaws that provide the legal framework for ASTTBC including standards of competence and code of conduct for registrants.

Common Terminology

The terminology used in the PGA and this study module may be somewhat different from nomenclature used in BC prior to the PGA or may continue to be used in other provinces or jurisdictions. The following definitions or explanations are used in this study module:

Association is commonly used by the advocacy bodies for technology professionals in each province. When the PGA was enacted, ASTTBC transitioned from being an association to being a regulatory body or regulator.

Complainant is the person or persons that have submitted a complaint to ASTTBC.

Respondent is the responding individual or firm that is the subject of a complaint.

Duty of care is the responsibility/obligation owed to other people and/or the environment. to act in a manner that does not cause harm to another person or the environment.

Negligence is if an individual or firm failed to live up to the required standards and duty of care.

Plaintiff is the person or persons claiming to have suffered the consequences of negligent actions and who seeks redress from the individual or firm through legal action.

Registrant is a registered individual listed on the ASTTBC registrant directory or register.

Registration is the action taken by the Registrar to enroll applicants approved by the Credentials Committee to be registrants. Only practising registrants have the right to use reserved titles and abbreviations such as Certified Technician (CTech), Applied Science Technologist (AScT) or Registered Technical Specialist (RTS) after their name.

Register (as a noun) is a list or directory of registrants accessible to the public as a valued source of information on the professional status of technicians, technologists and technical specialists. The Registrar maintains the register to accurately display the names, designation and current status of all registrants. When a registrant is first listed on the register their name continues to appear on the register even if their category or status changes from practising to any of the other nine options. https://asttbc.org/registrants/registrant-directory/

Respondent is a registrant or former registrant whose conduct or competence is the subject of a Complaint or discipline hearing.

Standard of Care refers to the competence and conduct of a registrant compared to that of a reasonable technology professional, as well as the requirements specified in various statutes, codes, regulations, and bylaws, standards, and guidelines.

The ASTTBC Council

Section 23 of the *PGA* establishes *"a council … for each regulatory body in respect of that regulatory body. The composition of a council consists of 7 registrant councillors, including the president and vice president, who are registrants of the regulatory body, and 4 lay councillors plus the immediate past president of the regulatory body, who is a non-voting registrant councillor."*

The Council is responsible for governing ASTTBC in accordance with the *PGA*, *Professional Governance General Regulation, Applied Science Technologists and Technicians Regulation*, and ASTTBC Bylaws.

Section 22 of the *PGA* describes the general duties and responsibilities of regulatory bodies as follows:

> 22 (1) It is the general duty of a regulatory body at all times to:
>
> (a) serve and protect the public interest with respect to the exercise of a profession, professional governance and the conduct of registrants in the registrants' regulated practice, and
>
> (b) exercise its powers and discharge its responsibilities in the public interest.
>
> (2) A regulatory body has the following responsibilities:
>
> (a) to superintend the regulated practice;
>
> (b) to preserve and protect reserved titles or reserved practices, as applicable, in the public interest;
>
> (c) to guard against the unlawful use of reserved titles or the unlawful practice of reserved practices;
>
> (d) to govern the registrants of the regulatory body according to this Act, the regulations and the bylaws;
>
> (e) to establish the conditions or requirements for registration of a person as a registrant of the regulatory body;
>
> (f) to establish, monitor and enforce standards of practice to enhance the quality of practice so that registrants avoid (i) professional misconduct, (ii) conduct unbecoming a registrant, and (iii) incompetent performance of duties undertaken while engaged in the regulated practice;
>
> (g) to establish and maintain a continuing competency program to promote high practice standards amongst registrants;
>
> (h) to establish, monitor and enforce standards of professional ethics amongst registrants;
>
> (i) establish and employ registration, investigation and discipline procedures that are transparent, objective, impartial and fair;

(j) to administer the affairs of the regulatory body and exercise its powers and perform its duties under this Act or other enactments.

ASTTBC Regulations

Within the PGA, there are general and ASTTBC-specific regulations that provide:

- the legal definition of engineering disciplines;
- the practice of applied science technology;
- the definition of reserved practices; and
- reserved titles for ASTTBC registrants.

The following three statements from the regulations define what ASTTBC registrants are legally entitled to do within their discipline, designation and practice.

"engineering discipline" *means agricultural, biomedical, bioresource, biosystems, building, chemical, civil, computer, electrical, environmental, food, forest, geological, geomatics, industrial, marine, mechanical, mechatronics, metallurgical, mining, naval architecture, nuclear, petroleum, software and structural engineering and engineering physics;*

"practice of applied science technology", *subject to subsection (2), means the provision of:*

(a) advice or services that are based on an engineering discipline, or

(b) advice or services that are ancillary to those described in paragraph (a);

"reserved practices of professional engineering or geoscience" *means the practice reserved under section 5 or 9 of the Engineers and Geoscientists Regulation.*

Subsection (2): *The practice of applied science technology does not include the provision of advice or services within the reserved practices of professional engineering or geoscience except under the supervision of a registrant of the Association of Professional Engineers and Geoscientists of the Province of British Columbia.*

Reserved titles listed in the ASTTBC-specific regulations further describe section 51 of the PGA for the exclusive use of ASTTBC registrants are:

(a) "applied science technologist";

(b) "applied science technologist trainee";

(c) "certified technician";

(d) "certified technician trainee";

(e) "registered technical specialist"

ASTTBC Bylaws

The next layer down from the Act and the Regulations is the ASTTBC Bylaws that provide more detail on the governance functions of ASTTBC and the requirements to be certified and registered technology professional. The Bylaws consist of 11 Parts and 8 Schedules, including the criteria and standards for applicants to be certified and registered or enrolled as a technologist, technician or technical specialist. ASTTBC Bylaws include of the following:

Part I Council Elections and Operations;
Part II Committees;
Part III Administration of ASTTBC;
Part IV Admission and Practice rights;
Part V Firms;
Part VI Continuing Education and Professional Development;
Part VII Audit and Practice Reviews
Part VIII Complaints, Investigations and Discipline
Part IX ASTTBC Records
Part X Stamps and Seals
Part XI General

ASTTBC Vision, Mission and Values

Within the framework of the PGA, regulations and bylaws the ASTTBC Council determined the following vision, mission and values for ASTTBC:

ASTTBC Vision

Regulation of Technology Professionals that safeguards the public through leadership and excellence.

ASTTBC Mission

We serve the public by contributing to a safe, sustainable society and environment by regulating Technology Professionals. We accomplish this through supporting the competent, safe, and ethical practice of applied science technology in British Columbia.

ASTTBC Values

- Professionalism: We uphold a foundation of high standards, ethics and competence to ensure accountability of our registrants.
- Accountable: We are invested in our responsibility to Government and British Columbians.

- Integrity: We are honest, dedicated, ethical and fair by doing the right thing every time, for the protection of the public.
- Inclusion: We embrace the principles of equity, diversity, inclusion, cultural safety and humility.

Summary of Part 1: Professional Governance Act

Part 1 of this study module described the legal framework that defines and differentiates ASTTBC technicians, technologists and technical specialists as technology professionals. Only technology professionals registered with ASTTBC have the right to use the titles reserved to them under the PGA. Professional registration carries with it a high level of responsibility. Trainees, technicians, technologists and technical specialists registered with ASTTBC are obliged to comply with the requirements specified in the PGA, Regulations Bylaws, and ASTTBC standards and guidelines, as well as other applicable legislation.

Part 2: Professional Practice

Part 2 of the PPE Study Module examines what it means to be and to practise as an ASTTBC technology professional.

The Oxford dictionary defines ‘professional’ as a *“A person working or performing for payment; someone highly skilled.”* As an adjective professional means *“of or belonging to a profession or its members; having or showing the skill of a professional; doing a certain kind of work to make a living.”* Other definitions of professional describe individuals as being qualified and practising in a definable area, having expertise based on a deep level of knowledge, and having a commitment to the area of practice – possibly through being a registrant of a relevant professional body.

Closely linked to being a professional is the concept of ‘professionalism’ which is defined as a *“the qualities or skills of a profession or professionals.”* This establishes the connection between professional and professionalism. This study module and the supporting resources explain in much greater detail what it means to be a professional technician, technologist or technical specialist.

The defining characteristics of a professional include much more than technical competence. In the following list of attributes of a professional only one of the six descriptors directly refers to technical competence. Can you identify which descriptor refers to technical competence?

Attributes typical of a professional include the following:

1. An obligation to respect the safety of the public and protect the environment;
2. A relationship of trust with clients or employers;
3. Compliance to a code of ethics to ensure conduct that is in the public interest.
4. Specialized knowledge and skills through focused education and work experience;
5. Certification and registration with a government-mandated professional body; and
6. A connection of mutual respect with fellow members or registrants of the profession.

The fourth attribute refers specifically to knowledge, skills and work experience required to be competent.

The Role of Technology Professionals in Society

The journey to becoming a technology professional requires years of education, training and supervised work experience or practice in a specific discipline or technical specialization. In addition to the essential knowledge, skills and abilities, technology professionals are obliged to hold paramount the safety, health and welfare of the public, the protection of the

environment while promoting fairness, respect, trust and safety in the workplace and community.

Technologists, technicians and technical specialists are skilled professionals who help ensure that technology-based systems and infrastructure are properly designed, manufactured, tested and maintained. Their expertise is applied across a wide range of fields from laboratory analyses for quality control in food production to transitioning engineering documents into detailed construction or fabrication drawings and specifications.

The Role of Technology Professionals on Technical Teams

Many technology professionals work closely with engineers, applying engineering principles and methods to resolve complex technical problems related to project, product or process design, construction and operation. Experienced technology professionals frequently manage projects and supervise other members of engineering teams working on projects or in work settings such as quality control, systems testing, construction, manufacturing and maintenance.

On projects such as road and bridge construction, municipal infrastructure, environmental cleanup or construction of large commercial or residential buildings, engineers, geoscientists, technologists, technicians and tradespersons work together as essential members of an integrated technical team. Each team member brings their own unique skills, knowledge and competence required for the team to function efficiently and effectively.

Responsibility to the Employer and the Public

When employed by a firm or a municipality, the employer has an expectation that their employees have a duty to work in good faith and not deliberately do anything which may harm the employer's business. Professional employees are expected to use their skills and training to advance the organization's objectives, follow instructions from more senior personnel, protect proprietary information and present the organization in a positive way to the outside world. ASTTBC registrants whether employed by a firm or municipality or self-employed are obliged to comply with all 26 principles in the ASTTBC Standards of Competence and Code of Ethics.

ASTTBC technology professionals are expected to practise safely, ethically, and competently, avoiding preventable harms to the public and environment. The first principle in the ASTTBC Standards of Competence and Code of Ethics states:

> "ASTTBC registrants are expected to hold paramount the safety, health and welfare of the public, including the protection of the environment and the promotion of health and safety in the workplace."

Many of the principles in the ASTTBC Standards of Competence and Code of Ethics describe what registrants are expected to do in support of the first principle.

From the start to the end of their professional careers, ASTTBC registrants will frequently find themselves in situations requiring ethical decisions. When such situations occur, the technology professional should always be guided by the principles in the ASTTBC Standards of Competence and Code of Ethics.

The following example describes a situation in which the instructions of an employer to and an ASTTBC registrant employed by the firm conflict with the registrant's duty to comply with ASTTBC Standards of Competence and Code of Ethics.

> *A mining company manager instructs an ASTTBC technologist employee to do the design drafting of a waste disposal system that allows untreated waste to escape from a settling pond into a nearby watercourse. The registrant is knowledgeable in the environmental protection regulations and knows how to design a waste disposal system that will not harm the environment. The proper system would be much more expensive and take longer to build. The employee has no authority or responsibility for deciding whether the employer will ultimately build the settling pond or if regulating agencies will permit the pond to be built as designed. The registrant realizes their loyalty to the employer is important. However, registrants are obliged to comply with the ASTTBC Standards of Competence and Code of Ethics to protect the public and the environment.*

The central questions are:

1) When does a professional's responsibility to the public and the environment override their expected loyalty to the employer?
2) How many principles of the ASTTBC Standards of Competence and Code of Ethics apply directly to this situation?
3) What action should the registrant (employee) take with the mining company manager (employer) in order to comply with the ASTTBC Standards of Competence and Code of Ethics while at the same time ensuring that the employer can continue to operate as a viable enterprise?
4) What action should the ASTTBC registrant (employee) take if another professional accepts the task as instructed by the manager and completes the design drafting of a

waste disposal system that will allow untreated waste to escape from a settling pond into a nearby watercourse?

Discussion

Registrants must at all times hold paramount the protection of the public interest and the environment. Firms employing technology professionals should realize and respect their employee's responsibility to comply with regulations and standards to protect the public and the environment. In this situation, the registrant could explain to the manager that design drafting of a waste disposal system as requested would be a breach of at least 10 of the 26 principles in the ASTTBC Code of Ethics. The registrant should provide the manager with their professional opinion on the proposed system design and clearly describe how it would contravene various regulations and harm the environment. The ASTTBC registrant should propose an alternate design that would prevent untreated waste from escaping from the settling pond. If the manager rejects the ASTTBC registrant's opinions and recommendations then assigns the drafting design to another employee or contractor that follows the manager's instructions to design a system that does not comply with environmental regulations the ASTTBC registrant may have a duty to report such unethical practice to ASTTBC or another regulatory body under the *PGA*.

Conflict of Interest

Technology professionals may frequently find themselves in a situation of perceived or real conflict of interest. It is critically important to recognize the circumstances or conditions that lead to a conflict of interest and the action required to mitigate such situations.

Principle h. of the ASTTBC Standards of Competence and Code of Ethics states.

> "ASTTBC Registrants are expected to avoid situations and circumstances in which there is a real or perceived conflict of interest and ensure conflicts of interest, including perceived conflicts of interest, are properly disclosed and necessary measures are taken so a conflict of interest does not bias decisions or recommendations."

The following three examples illustrate situations in which a registrant is in real or a perceived conflict of interest.

Example 1: Selection of firms for procurement of goods or services

The close relative of an ASTTBC registrant is in the concrete supply business. While working on a bridge deck project, the registrant is instructed by the employer to review

expressions of interest (EOI) from seven firms and prepare a shortlist of three suppliers that will be invited to submit a full proposal to supply concrete for the project. The technologist includes their close relative's business as one of the three shortlisted firms. The technologist did not inform the employer that a close relative in the concrete supply business is with one of the shortlisted firms.

Discussion: The technologist's shortlisting of firms may appear to be biased by a conflict of interest. In such situations disclosure of perceived conflict of interest to the employer is necessary. Furthermore, the technology professional should have consulted with the employer at the start of the assignment to agree on the selection criteria to be used when assessing the seven EOIs. A written record of why the firms were selected based on the criteria is also required. Keeping a clear record of all actions and decisions is essential to demonstrate transparency in the selection process.

Example 2: Ownership interest in firms, property or products

An ASTTBC Registered Onsite Wastewater Practitioner (ROWP) is retained by a property owner to inspect a septic system whose components were manufactured by a company in which the ROWP holds 25% of the shares. The ROWP's professional obligation to provide the client with a factual and objective inspection and report on system performance may be or appear to be in conflict with their interest in protecting the component manufacturer's reputation and hence the value of the ROWP's shares in the company.

Discussion: Even if no improper acts result from the conflict, it can still create the appearance or perception of impropriety that can undermine confidence in an individual or an organization. In the context of technology professionals, a conflict of interest has the potential to interfere with an individual's judgment and potentially compromise their protection of the public interest.

Even with the best of intentions, it may be difficult for an individual to identify that they are in, or about to enter into, a conflict of interest whether real or perceived. When in doubt, reviewing the ASTTBC Standards of Competence and Code of Ethics, discussing the situation with a peer or supervisor, and/or contacting ASTTBC's Practice Guidance Program, can help provide clarity in making an objective decision on how to manage a conflict of interest.

Example 3: Unexpected discovery of perceived conflict of interest

An AScT in the environmental discipline was contracted by an architect to do an environmental assessment of an ocean-front lot to determine if the proposed location and size of a new house on the lot would be within municipal and environmental regulations. The AScT registrant accepted the assignment and signed a contract with the architect without knowing who owned the ocean-front property. The environmental assessment report concluded that the location and size of the house was within the standards specified in various environmental and municipal regulations. When the architect submitted an application for a building permit, the municipal authority observed the environmental assessment was done by a relative of the property owner and questioned the validity of the environmental assessment report.

Discussion: In this example the AScT (environmental) signed the contract in good faith with the architect. There was no obvious conflict of interest as the identity of the property owner was unknown to the AScT registrant when the contract was signed and when the environmental assessment field work and report writing was completed. Nevertheless, the perception that a professional decision could be biased because of a relationship or connection to the architect's client illustrates how easily a perceived conflict of interest could occur.

The skills and competence of ASTTBC technologists, technicians and technical specialists are needed by the public and great reliance is placed on registrants to ensure the safety and well-being of society and the environment. The professional must always be aware of possible conflicts of interest and must be prepared to put the needs of the public and their clients above their own.

Annually Declaring Awareness of the Duty to Avoid Conflict of Interest

The ASTTBC Bylaws Part VI, section 59 states:

> *"59. On or before November 30 of each year, practising registrants must submit a declaration in a form approved by the registrar attesting that they are aware of their duty to avoid conflicts of interest.*
>
> *59.1 The filing of a conflicting of declaration and disclosure form does not absolve the registrant from the responsibility to address the real or perceived conflict of interest."*

The annual declaration refers to the registrant's awareness of their duty to avoid conflicts of interest. It does not require reporting of every situation in which there is a real or perceived conflict of interest. When submitting the declaration annually in November, registrants should take the time to reflect on the various situations throughout the year when they were in a real or perceived conflict of interest situation. This will refresh their understanding and awareness

of the circumstances leading to a conflict of interest. Recalling the actions they took to mitigate conflict of interest situations will further support the registrant’s declaration of awareness.

Professional Liability Insurance

The ASTTBC Bylaws Part XI section 86 requires technicians, technologists and technical specialists to have professional liability insurance (PLI) to protect the public, clients or other parties alleging that they have been harmed by the professional's actions or failure to act.

While some employers may have professional liability insurance coverage that extends to their employees all ASTTBC registrants, regardless of their employment status, are required to be insured. Failure to be insured is taken extremely seriously by regulators. If a member of the public or the environment is harmed by the actions of a registrant, it is important that the individual(s) affected be compensated in order to maintain public confidence and trust in the profession. In the event that an uninsured registrant was unable to compensate a person or persons for harm caused by his or her practice of applied science technology, it is likely that the public would lose confidence and trust in technology professionals, generally. ASTTBC registrants should consult with an insurance broker to determine the most appropriate level of PLI coverage for their circumstances and practice.

Duty of Care

Technologists, technicians and technical specialists have multiple levels of responsibility when undertaking their work. They are bound by contractual obligations which lay out what is expected in terms of deliverables, schedule and payment for each project, product or service. Professionals also have a fiduciary duty that places them in a position of trust in terms of their relationship with the public. The fiduciary or 'trusted person' must not allow any personal interests to conflict with their obligations to their clients, the public, and the environment. As professionals, technologists, technicians, and technical specialists are subject to higher expectations in regard to safety, ethics, and competence than ordinary citizens.

Standard of Care

Determining if a registrant has provided professional services or products to a standard of care required of the technology professional is a complex undertaking. Such a determination would be based on evidence that in the exercise of their duties, the professional used reasonable judgement, care and skill expected of a competent registrant. Reasonable care would in turn be measured against applicable professional standards at the time the services

were performed. If negligence or incompetence is proven, the registrant would not have fulfilled the duty of care or the standard of care required when providing professional services or products.

The same standard of care is expected from new or less experienced professionals. There is no leeway given and if not sufficiently competent, a less experienced technology professional should decline the work or seek someone more capable to do the work or supervise the project.

Importance of Standards to Technology Professionals

In general terms, a standard is an established norm or requirement that helps ensure that desirable characteristics such as performance, quality, environmental friendliness, safety, reliability, efficiency and interchangeability are achieved.

The standard itself is usually a formal document that defines uniform methods, processes and practices. The working environment is full of standards that describe how work is to be done in a way that, if followed, will protect the public, the environment and the professional.

From the technology professional's perspective, standards of practice, typically defined by government legislation or by generally accepted industry practice, help registrants understand and provide their services while taking professional responsibility within their field and their defined scope of practice.

Regulations, Bylaws, Codes and Practice Standards

Technologists, technicians and technical specialists should be familiar with all legislated bylaws codes and standards that may limit their scope of practice in the supply of works and services. It is the registrant’s responsibility to know the applicable regulations, codes and standards for the work they do on various projects or services they provide.
Standards can have a direct or indirect influence on how work is performed. As examples, these can include, but are not limited to:

- WorkSafe BC and other occupational health and safety requirements must be met by all workplaces.
- Technical Safety BC requirements for the installation and operation of electrical and gas equipment, boilers, pressure vessels, elevators, chairlifts, gondolas and amusement rides.
- Canada and BC Building Code: Sets out technical provisions for the design and construction of new buildings.
- National Fire Protection Association (NFPA) Codes and Standards for the installation, inspection and testing of fire protection equipment and systems.

- BC Ministry of Health, Sewerage System Regulation (SSR), Standard Practice Manual (SPM) for the construction and maintenance of onsite wastewater systems in BC.
- Standards Council of Canada (SCC): Facilitates the development and use of national and international standards and accreditation services to enhance Canada's competitiveness and social well-being.
- International Organization for Standardization (ISO): The world's largest developer and publisher of International Standards. These include the requirements for quality management and environmental management systems as well as for a wide range of individual products and industry sector-specific needs.

The above listed examples are a small representation of the codes and standards that define how organizations operate and individuals practise in a manner that protects the safety of the public and the environment. Every discipline and occupation specialty has codes and standards that must be followed. Ultimately, it is the responsibility of the technology professional to identify which standards are applicable to their work and to incorporate the requirements into their practices.

Risk Management

Risk management and the development of a risk management plan is about reducing the exposure of companies, projects, individuals or clients to unfavorable or uncertain conditions over the course of a project or service agreement. Risk management is a preventative exercise that focuses on increasing awareness of factors that may affect the overall work plan and defines how risks will be cost-effectively managed. Risks can include financial exposure, physical damage to persons, property or the environment, changes in market demand, poor employee or subcontractor performance, competition from others, accidents and unintended consequences.

A risk management plan should include goals, strategies and methods for performing risk management and describe all aspects of risk identification, estimation, evaluation and risk control processes. It will also assign the person responsible for managing each category of risk. Some key ways that a technology professional can minimize risk include:

- Evaluating the project for potential issues related to protecting public interest and the environment.
- Preparing a written contract to be signed by the client that specifies the work to be done and clearly defines the limits of the services and deliverables to be provided.

- Confirming that the work to be completed is within the technical competence of employees or contracted personnel.
- Communicating regularly with the client, particularly when changes are anticipated.
- Purchasing insurance for various types of risks.

On large projects, sharing the risk with others is a common and reasonable approach to reducing exposure, although a judge could later review whether the risk should have been apportioned as agreed. The basic test of how risk is to be allocated is that the party best able to bear the loss is the one that should bear the risk. Ideally, parties involved in a project enter into allocation and responsibility clauses so that potential disputes are resolved at the beginning of a project, rather than at the end.

Contracts

A contract is a legally enforceable, mutual agreement between two or more parties to perform a lawful act for legal payment. There is an offer of a product or service by one party and an acceptance by the other. The offer must be expressed so it can be accepted without anything further being required of the party receiving the offer other than to indicate acceptance. It must also be clear that the party making the offer is prepared to be bound by the contract terms if the offer is accepted.

When signing a contract, it is extremely important that each party understands what the contract conditions cover. If a court case were to be brought forward by one of the parties, the courts would proceed on the basis that each party knew, understood and agreed to the contract when it was signed. Undertaking a thorough risk assessment for any project prior to arriving at a value for the work to be performed is very important.

Registrant Record Keeping

ASTTBC Bylaws section 88 specifies that registrants must maintain contemporaneous, accurate and comprehensive records for at least 10 years. Maintaining digital and other forms of documentation including drawings, photos, video or audio recordings in an orderly and secure manner is essential to protect against any claim or complaint that may be filed. Taking the time to develop a document management system is essential to keep files in an orderly manner. Protecting the documents from damage or loss is an extremely important consideration to be able to retrieve documents many years after completing a project or work. Organizing documents chronologically and/or by project or service will make it easier

to retrieve information if or when a situation arises that you must provide evidence of the work or services you provided.

Complaints and legal claims are often complex and each case is considered independently based on the context, circumstances and evidence. The amount of time from when the work was done or not done to when a complaint or claim is submitted can vary significantly. This is an important consideration when determining the start date of the limitation period. In some cases, the time limit to act begins when the error, omission or failure is discovered which could be several months or years after the work was done.

Complaints, Investigations and Discipline

ASTTBC Bylaws Part VIII Complaints investigations and discipline outlines the process and procedures for dealing with any complaint submitted to ASTTBC against a registrant that alleges the registrant engaged in incompetent practice, professional misconduct, conduct unbecoming or a violation of the PGA and/or the Bylaws. Complaints may be submitted by any member of the public, by registrants of ASTTBC or other regulatory bodies or from authorities having jurisdiction over a matter. The complainant must describe in writing the alleged incompetence or inappropriate conduct of the registrant (respondent) that is the reason for the complaint. The investigation committee reviews complaints and determines the course of the investigation as well as the disposition of complaints. The Registrar can also dismiss complaints if they are frivolous, vexatious, or outside of ASTTBC's jurisdiction. Complaints are prioritized by ASTTBC upon receipt to determine whether any initial investigation steps should be taken by ASTTBC prior to referral to the investigation committee or whether extraordinary action should be taken to limit or restrict the respondents practice while the complaint is investigated. .

The registrant that is subject of the complaint is referred to as the respondent and is provided a copy of the complaint and requested to comment on the allegations. A registrant has a duty to cooperate with a regulatory investigation. It is important that respondents maintain and provide accurate records of their work and provide various forms of evidence such as drawings, photographs, videos, financial records, and correspondence.. ASTTBC is obligated to investigate complaints against registrants. The investigation committee may also appoint an inspector with powers under the PGA to investigate the complaint and report to the investigation committee. If an inspector is appointed by the investigation committee, the inspector has the authority to attend a registrant's place of business during business hours to inspect the registrants place of business, equipment and to review the registrants records and make copies. Obstructing an inspector constitutes an offence under the PGA that is punishable by a fine of up to $200,000 and/or a term of imprisonment up to 2 years.

The majority of complaints are resolved with consent of the respondent. However, if a investigation is of the view that the registrant has engaged in professional misconduct, conduct unbecoming, incompetent practice or a violation of the PGA and/or the Bylaws the investigation committee can dispose of the complaint in the following ways:

- Take no further action;
- Issue a letter of caution to the registrant;
- A reprimand and remedial action by consent: The registrant admits to wrongdoing and undertakes not to repeat it in the future as well as to engage in remedial education, to pay a fine or take other action as specified by ASTTBC;
- A consent order: the registrant admits to wrongdoing and undertakes not to repeat it in the future, to agree to limits or conditions on their practice, to pay a fine, to undertake remedial education, to agree to cancel or suspend their practice for a period of time, or any other action specified by ASTTBC;
- Refer the matter to the Audit and Practice Review Committee for a practice review;
- Refer the matter for alternative complaint resolution: a mediator can be appointed to attempt to resolve the matter between the complainant and registrant. This can result in a consent order as well; and
- If ASTTBC and the registrant are unable to resolve a matter by consent, direct the Registrar to issue a citation for a discipline hearing. A citation sets out the formal allegations against a registrant, to be heard by a panel of the Discipline Committee. Citations are published on ASTTBC's website and a hearing will be set before a separate discipline committee to hear the evidence and make a decision. Following a hearing, if the allegations are proven, the discipline committee may institute disciplinary measures against the registrant, up to and including a suspension of the registrant from practice and/or a cancellation of his or her registration to practise with ASTTBC.
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ASTTBC is generally required to publish certain outcomes of complaints, including reprimands and remedial actions by consent, consent orders, citations and disciplinary hearing outcomes. In addition, anonymized summaries of educationally helpful complaints and investigations addressed by ASTTBC are accessible to the public on the ASTTBC website.

Trainees

ASTTBC Bylaws Part IV, section 39 describes the requirements to be enrolled as a trainee and the conditions for being supervised. Trainees are required to submit an application for enrolment including evidence of successfully completing the education or training requirements for the applicable category and passing the Professional Practice and Ethics exam. Trainees may only engage in applied science and engineering technology practice while under the supervision of a practising registrant of a regulatory body designated under the PGA. Trainees are not permitted to have or use a stamp or seal.

Supervisors of Trainees

ASTTBC Bylaws Part IV, section 40 states: .

> "A supervisor must be a registrant in good standing of a regulatory body designated under the Act who has at least three years experience and practices in the same area as their student or trainee."

The supervisor must be in regular communication or physically present with the student or trainee and is responsible for supervising the quality and thoroughness of work performed by the student or trainee. The supervisor must take responsibility for the work. A supervisor may not be responsible for more than four trainees at the same time.

Delegation of Work

ASTTBC registrants must refrain from assigning or delegating work to other registrants or any other person that is outside of the scope of that person's registration, knowledge, skills, experience and competence. Before delegating or assigning work to others, the ASTTBC registrant must check the current registration status of any professional that will be assigned regulated work. A discussion or interview with any person to be assigned work will reveal if the person has the knowledge and skills required to complete the assigned work. When the work is in progress, observation of the person and checking the quality of work is essential in building confidence and trust that the person is competent.

Seals and Stamps

Registered technologists, technicians and technical specialists in good standing are entitled to be issued and use an official seal or stamp. ASTTBC Bylaws specify the conditions for the issuance and use of seals and stamps. ASTTBC Bylaws Part X states:

> Seals, ink stamps digital stamps and signatures may be used by registrants in good standing on any preliminary, draft or final document which has been prepared by the

registrant or prepared under their immediate supervision. A sealed or stamped document indicates that it has been prepared or reviewed by a technology professional.

Notification of Change in Registrant Information

ASTTBC Bylaws section 51 requires registrants to notify the registrar not later than 14 days of any change in name, address, e-mail, place of employment or other contact information previously provided to the registrar.

Maintaining ASTTBC Professional Registration

Achieving registration as a technology professional is a significant accomplishment that recognizes your knowledge, skills and experience. Schedule A of the ASTTBC Bylaws lists the education and experiential requirements for initial certification and registration in various classes, sub-classes, disciplines and specialties. Part VI of the ASTTBC Bylaws specifies the requirements for all registrants to annually renew their registration by providing a record of the following no later than November 30:

- a declaration of competence and currency of practice;
- a declaration of awareness of the Duty to Avoid Conflict of Interest and
- payment of annual professional dues.

Continuing Education or Professional Development (CPD)

Technology professionals are accountable to both the public and their profession for protecting the public's health and safety, the environment and the economy. The public expects that technology professionals will perform their work using up-to-date knowledge and expertise. Technology is constantly changing through innovation and development of new products, processes, tools, methods and standards. It is essential for registrants to remain current with technological changes and practices in their discipline or technical specialty. Specific CPD requirements and a convenient online process for documenting CPD activity are available to ASTTBC registrants by logging into their account at https://registrants.asttbc.org/web

The importance of CPD is reinforced in Part 6 of the PGA which addresses protection of the public interest with respect to professional governance and conduct. Section 57 states: *"the council of each regulatory body must make bylaws establishing the following:"*

“(e) continuing education programs or requirements for qualified continuing education for individual registrants, which programs or requirements may be different for different specializations;

(f) continuing education programs or requirements that support reconciliation with Indigenous peoples in British Columbia”

The ASTTBC Council prepared bylaws that include Part VI, Continuing Education and Professional Development specifying, among other things, the requirement of annually completing CPD and the consequences of not doing so.

Read sections 54 to 60.4 of the ASTTBC Bylaws to determine the answers to the following questions.

1. How many CPD hours are required each year to maintain your registration for the following year?
2. Where are registrants expected to record their CPD?
3. To comply with currency of practice requirements, how many hours of practice are required within a two-year period?
4. What is the deadline for entering your CPD, declaring currency of practice and paying your annual dues?
5. What are the consequences of not complying with the CPD requirements?

Summary of Part 2: Professional Practice

Understanding the legal framework, governance and requirements of practising as an ASTTBC registrant provides the foundation for professional practice. Compliance to PGA, ASTTBC-specific regulations and Bylaws including the Standards of Competence and Code of Ethics and other practice-specific standards and guidelines is a requirement for all registrants. Concerns over risk management, contracts, insurance and liability are of increasing importance especially for professionals that provide services directly to the public. ASTTBC investigates complaints against registrants in accordance with the *PGA* and ASTTBC Bylaws. Registrants have a duty to cooperate with investigations.

Part 3: ASTTBC Standards of Competence and Code of Ethics

Part 3 of this study module provides and overview of ethics and identifies approaches to help professionals decide on the most appropriate action to take under various circumstances. Professional practice typically involves numerous situations where there are conflicting choices often with serious consequences. Such situations require professionals to make decisions based on the proper and ethical thing to do. The following is an example of a situation requiring an ethical professional decision:

> An ASTTBC technologist employed by a manufacturing company collects data to prepare an environmental assessment report for the company that discharges water into a lake with a significant fish population. The data indicates that the pollution level in the discharge is higher than legal limits but the cost to the company of addressing the problem is estimated to be in the millions of dollars. The supervisor asks the technologist to modify the data and the report so that the company appears to be complying with the legal requirements.

Questions to consider:

- What should the technologist do in this situation?
- What options are available to the technologist?
- What are the short and long-term consequences of each option?
- What resources are available to the technologist to help or support the decision?

The Standards of Competence and Code of Ethics found at Schedule D to the ASTTBC Bylaws describes how registered professionals are required to conduct themselves.They are intended to assist registrants in making decisions when faced with conflicting demands. The Standards of Competence and Code of Ethics is of central importance. Ethics have a defining role in what it means to be a professional. All ASTTBC registrants are expected to comply with the 26 principles (a to z):

a) hold paramount the safety, health and welfare of the public, including the protection of the environment and the promotion of health and safety in the workplace,
b) practice only in those fields where training and ability make the registrant professionally competent,
c) have regard for the common law and any applicable enactments, federal enactments or enactments of another province,
d) have regard for applicable standards, policies, plans and practices established by any level of government or ASTTBC,
e) maintain competence in applicable category, class, sub-class, and/or discipline, including advances in the regulated practice and relevant science,
f) provide accurate information in respect of qualifications and experience,
g) provide professional opinions that distinguish between facts, assumptions and opinions,

h) avoid situations and circumstances in which there is a real or perceived conflict of interest and ensure conflicts of interest, including perceived conflicts of interest, are properly disclosed and necessary measures are taken so a conflict of interest does not bias decisions or recommendations,

i) report to ASTTBC and, if applicable, any other appropriate authority, if the registrant, on reasonable and probable grounds, believes that the continued practice of a regulated practice by another registrant or other person, including firms and employers, might pose a risk of significant harm to the environment or to the health or safety of the public or a group of people,

j) present clearly to employers and clients the possible consequences if professional decisions or judgments are overruled or disregarded,

k) clearly identify each registrant who has contributed professional work, including recommendations, reports, statements or opinions,

l) undertake work and documentation with due diligence and in accordance with any guidance developed to standardize professional documentation for the applicable profession,

m) conduct themselves with fairness, honesty, and good faith towards clients, colleagues and others,

n) not engage in any conduct that the registrant knows, or ought to know, would bring ASTTBC or its registrants into disrepute,

o) not engage in any conduct that is likely to undermine the standards, methods or principles that are the foundation of the registrant's applied science and engineering technology practice,

p) treat other registrants, clients, employees and members of the public with respect and courtesy,

q) consider employer/client materials confidential and not use the proprietary/confidential information learned for personal gain or the advantage of other parties,

r) recognize the expectation of confidentiality does not hold where the employer/client actions are unlawful, in which case the registrant is obliged to report the activity to the appropriate authority,

s) be aware of and comply with applicable privacy legislation, including but not limited to the Personal Information Protection Act and the Freedom of Information and Protection of Privacy Act as applicable,

t) practice only when they are able to do so with reasonable skill, competence and safety to the public,

u) counsel students and trainees to perform those activities that are within their scope of knowledge, skill and judgment and not to exceed that scope,

v) ensure that any supervision provided to another person, whether a trainee, student or non-registrant, is provided to the best of the supervising registrant's ability and takes into account the knowledge, skill and judgment of the person being supervised,

w) take all reasonable steps to ensure that those under their direct supervision engage in the practice of applied science and engineering technology in a professional and ethical manner and in accordance with all applicable enactments and standards of competence,

x) refuse to counsel other registrants or non-registrants regarding the performance of work that is outside of the scope of that person's registration, competency, knowledge, skill, or training, as the case may be,

y) refuse to delegate work to other registrants in the performance of their regulated practice that is outside of the scope of that person's registration, competency, knowledge, skill, or training, as the case may be, and
z) uphold professional obligations to ASTTBC while in the workplace by ensuring any such obligations are treated as paramount to other work-related duties and encourage those that the registrant supervises to do the same.

Resolving Ethical Problems

In many day-to-day situations in the professional working environment, the ASTTBC Standards of Competence and Code of Ethics may well provide a solution to an ethical problem. For example:

> A civil engineering technician (CTech) with experience in municipal road and sewer construction was asked by a local environmental protection society to give some advice on the design of a boardwalk that will provide public access over a pond so that visitors can view the resident wildlife. Over the years, the CTech had been involved in many similar construction projects and has a good idea of what the finished boardwalk might look like. However, the CTech has no actual design or marine environment experience.

Familiarity with the 26 principles of the ASTTBC Code of Ethics should provide the CTech a clear indication of the professional decision required in the above example. At least 3 of the 26 principles in the ASTTBC Code of Ethics apply to the CTech in this example.
Read the ASTTBC Code of Ethics to determine if you agree that principles b, f, and g would be breached if the CTech provided advice on the design of the boardwalk.

Environmental Ethics

In recent years there has been increasing awareness of the critical importance of the environment and the impact of human actions on climate change. Most technology professionals are in some way connected to the health of the environment through their work.
The importance of environmental ethics and technology to the well-being of the public is reflected in the actions taken by the BC Government in 2018 in response to recommendations presented in the Professional Reliance Review report submitted to the Ministry of Environment and Climate Change Strategy. The report recommended increased oversight of regulation in the sector and led to the passage of the *Professional Governance Act* by the BC Legislature in November 2018 and the establishment of a Superintendent of Professional Governance.

Environmental Law

Environmental law is the starting point for any individual considering the impact of their proposed activities on the environment. Technology professionals therefore need to study and thoroughly understand the legislation that applies to their area of practice. In Canada, the federal, provincial, territorial and many municipal governments have laws, regulations or bylaws that limit activities that could adversely affect the environment.

Federal Government

Environment Canada is the federal government agency charged with preserving and enhancing the quality of the natural environment. The principal pieces of legislation for regulating the environment are the Canadian Environmental Protection Act and the Canadian Environmental Assessment Act. Other laws and regulations address fisheries, clean air, water and wildlife.

Provincial and Territorial Governments

Each province and territory has an environmental ministry, law and regulations. Details of each ministry's activities can be found on their respective web sites.

Municipalities

Many municipalities have implemented regulations that address environmental protection. For example, the City of Vancouver's Environmental Protection branch is responsible for enforcement of the Sewer and Watercourse and the regional Sewer Use by-laws which aim to eliminate the discharge of volatile or other hazardous substances into public and private sewers.

Professional Practice and the Environment

Every project carries some element of risk in terms of damage to the environment and perfection cannot be attained, nor is it expected. Conflicts are most to likely occur when the budgetary priorities of the employer clash with the professional’s duty of care, especially when management does not have an engineering technology background.
The Technology Professional's primary responsibility is to 'hold paramount the safety, health and welfare of the public, the protection of the environment and the promotion of health and safety within the workplace'.

The professional can best be prepared for meeting the expected duty of care and avoiding potential conflict by:

- being thoroughly familiar with the environmental laws, regulations and bylaws applicable to the work to be undertaken;
- understanding the impact of any release of potentially harmful substances into the environment;
- planning the full scope of the project from beginning to end so that all potential sources of pollution and their control have been considered; and
- maintaining at all times the high ethical standard defined by the ASTTBC Standards of Competence and Code of Ethics.

Attempting to identify all possible risks is extremely difficult as some events will be outside the control of the professional. Yet it is this ability to assess risk ahead of time that sets technology professionals apart and confers on them through training, experience and professional recognition the paramount responsibility to protect the public and the environment.

ASTTBC registrants must explain to management that minimizing the risk of environmental damage is worth the effort and cost involved. If this approach fails, the professional has a duty to refuse to carry out illegal and unethical actions and to report them as required by law..

Duty to Report

Section 58 of the PGA establishes a duty on ASTTBC registrants to report other registrants if the registrant has reasonable and probable grounds to believe that an identified registrant is engaged in their regulated practice in a manner that may pose a risk of significant harm to the environment or to the health or safety of the public or a group of people. the ASTTBC Standards of Competence and Code of Ethics principle I also states:

> ASTTBC registrants are expected to report to ASTTBC and, if applicable, any other appropriate authority, if the registrant on reasonable and probable rounds, believes that the continued practice of a regulated practice by another registrant or other person, including firms and employers, might pose a risk of significant harm to the environment or to the health or safety of the public or a group of people.

If a registrant makes a report under section 58 of the PGA, they are protected from reprisals from other people, including their employer and other registrants. If a person reprises against an ASTTBC registrant for making a report, being named in a complaint

or assisting with the investigation of a complaint, that person commits an offence under section 106 of the PGA.

If a registrant fails to make a report when they were obligated to under section 58, they may have engaged in professional misconduct and/or a violation of the Act.

Summary of Part 3: Ethics

Realizing the importance of and complying with the ASTTBC Code of Ethics is perhaps as important as technical competence. ASTTBC technologists, technicians and technical specialists practise within established standards, codes and procedures. Similarly, technology professionals know, or should know, the limits of their technical knowledge, skills and experience. Decisions on accepting project or work assignments need to take into consideration registrant's competence and compliance to the ASTTBC Code of Ethics. Throughout any project or assignment professionals are required to make numerous ethical decisions that require an honest answer to questions such as the following:

1. Do I have the knowledge, skills and experience to do the job?
2. Is the work within the scope of practice for which I am certified and registered?
3. Will the work be in the best interests of the public and the environment?
4. What risks are associated with the project and how will they be mitigated?
5. Will I be able to complete the job in compliance with the ASTTBC Standards of Competence and Code of Ethics?
6. Is here any real or perceived conflict of interest associated with my role or participation in the project or work?

Additionally, if the registrant intends to delegate work under the project, they should ensure that the person to which the work is being delegated is appropriately qualified, competent and experienced for the level of supervision being afforded to them. Additionally, the registrant should ensure that any delegated work is done in accordance with other relevant legislation.