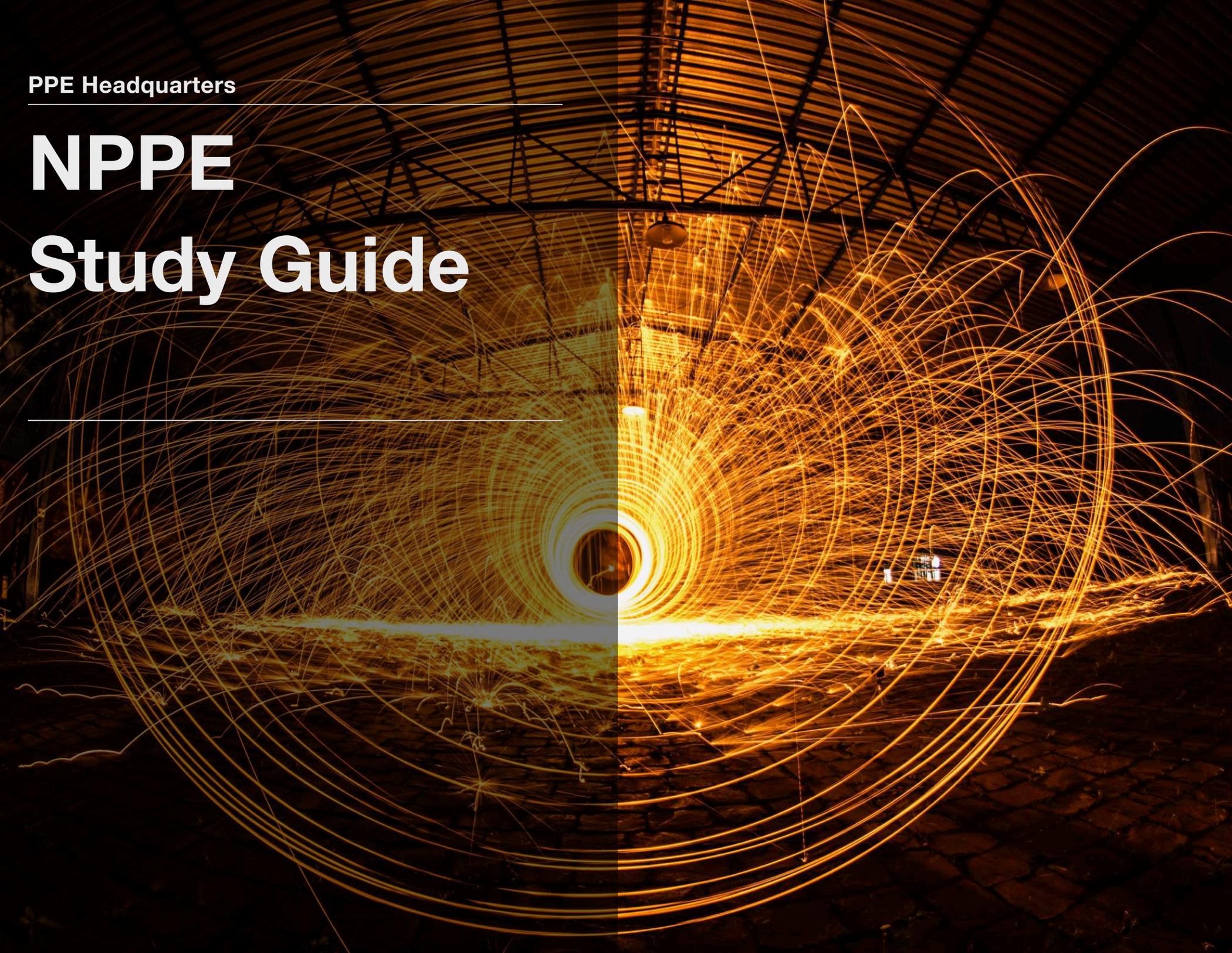


PPE Headquarters

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# NPPE Study Guide

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# The Keys To Smart NPPE Preparation

I graduated from the University of Saskatchewan with a degree in Mechanical Engineering. I took two weeks off to prepare for my NPPE exam – two weeks of my hard earned vacation time.

I purchased the textbooks and began making study notes on those textbooks. About 60% of the way through the process, I realized I should have based my study notes on the NPPE syllabus.

I based my study notes on the textbooks and wasted a lot of time on material that wasn't on the exam. I don't even want to think about the time I wasted making study notes of the OH&S manual and the CIPO documents only the find out they were worth less than 5% of the exam. **Super Disappointed!!**

The purpose of this study guide is to make this exam experience as quick and painless as possible for you. There is no reason you cannot get through this material in a weekend. Do not take two weeks of as I did. Do not make study notes on the textbooks, follow the syllabus.

This study guide reduces the reading from 875+ pages to less than 70 pages. That material will go quick, so the real power is in practicing exam questions. Make sure you are familiar with the unique style of questions asked in the exam.

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PPE Headquarters

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# Introduction

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## The National Professional Practice Exam (NPPE)

The NPPE is a closed book exam of 110 multiple choice questions to be completed within 2-1/2 hours.

**A mark of 65% is required to pass the NPPE !**

The syllabus for the NPPE and the weighting of each section is provided by APEGA.

This study guide and the exam questions are based and weighted on the syllabus to minimize your reading and the overlap of the textbooks. That will keep you from making the time wasting mistake that I did. There are many sections of the suggested material that you shouldn't bother reading at all.

It is important to realize Alberta's Association, APEGA, administers the NPPE and this exam is used by many other Associations including:

- **APEGM** – Manitoba
- **APEGBC** – British Columbia
- **Engineers Nova Scotia**
- **APEGNB** – New Brunswick
- **PEGNL** – Newfoundland and Labrador
- **Engineers PEI** – Prince Edward Island
- **NAPEG** – Northwest Territories and Nunavut
- **Engineers Yukon**

The exclusions are Quebec, Saskatchewan, and Ontario. So it is important to realize that a few topics in the exam must be generic to suit all the Associations. Let's use this information wisely:

- **DO NOT** memorize your particular Association's Act, Bylaws, or Regulations.
- **DO NOT** memorize your particular Association's Code of Ethics. The common themes of each Association's Code of Ethics are summarized within this study guide.
- **DO NOT** spend much time reviewing your Province's Occupational Health and Safety Act. Each Province and Territory has their own, and the questions relating to this subject will be generic to all. This study guide outlines generic material common to all Associations.
- **DO NOT** spend much time reviewing Province specific material suggested in your Association's Literature Order information. For example, APEGA suggests a Royal Bank Letter; yet, the vast majority of Associations do not. It is very reasonable to assume that reading this document is not required.

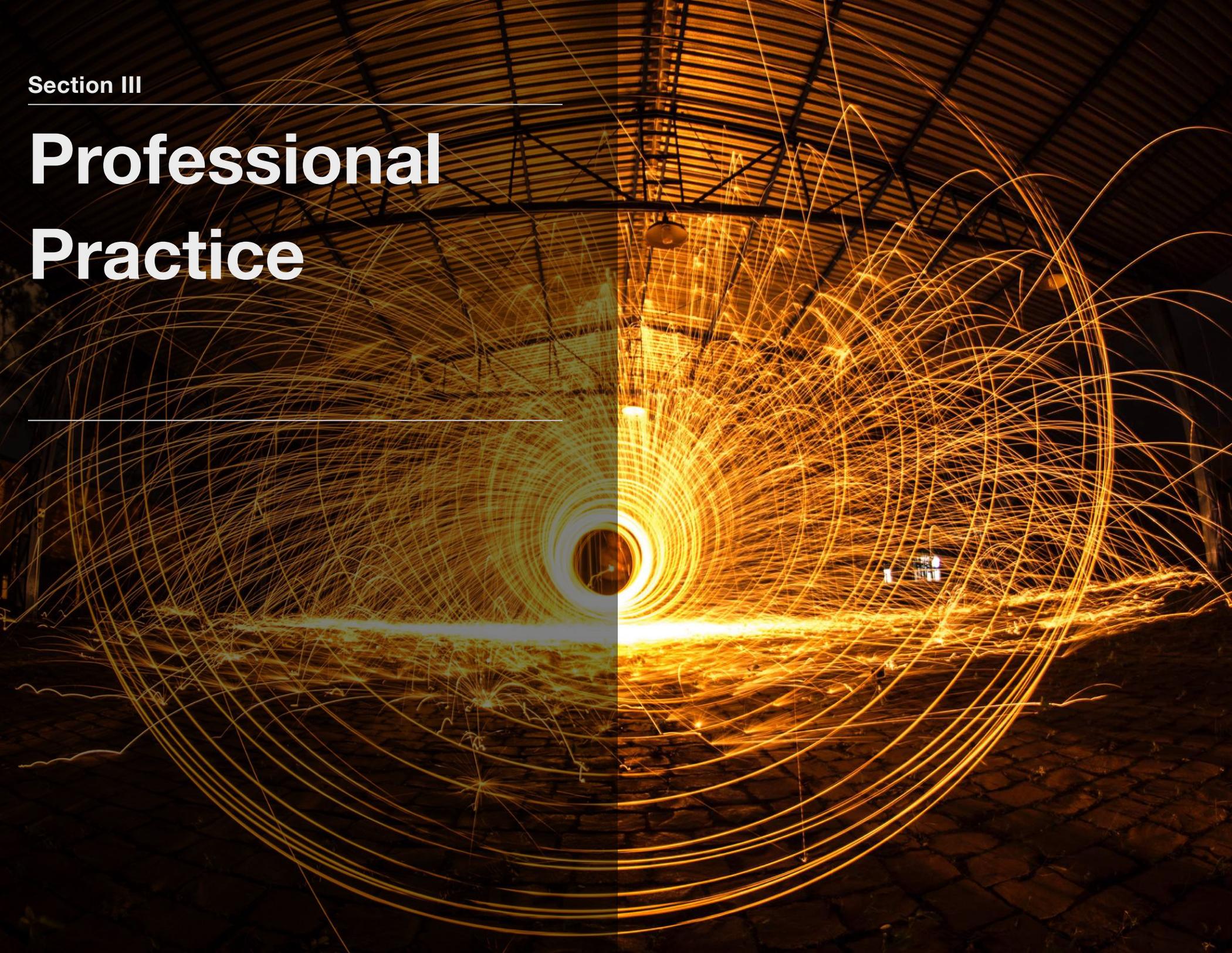
Use these tips, be smart about this exam, and conserve your time.

Section III

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# Professional Practice

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## Section III: Professional Practice (30% or 27-32 Questions)

### III.1 Professional Accountability for Work, Workplace Issues, Job Responsibilities & Standards of Practice

The levels of professional job responsibility and accountability are straight forward, closely associated to the Associations Salary Survey and are categorized as follows:

- **Level A** – Entry level or graduated university
- **Level B** – Engineer, MIT or EIT or Geol. IT
- **Level C** – Professional Engineer
- **Level D** – First Supervisory or Specialist role
- **Level E** – Middle Management or Senior Specialist
- **Level F** – Senior Management or Consultant Specialist
- **Level F+** - Senior Executive Level

My guess is that you're very familiar with these levels since they are directly influence your current salary ☺

Further insight into these accountabilities, responsibilities may be gleaned from the experience requirements to obtain a license:

- Application of Theory
- Management of Engineering – planning, budgets, supervising, risk assess
- Communication Skills – oral, presenting, reports
- Social Implications of Engineering
- Practical Experience

**Tricky Exam Material** - note that perfection is not required of all documents; however, the key terms that are expected include reasonable judgment based on adequate knowledge and adequate experience.

Also a professional attitude helps form a healthy standard of practice. A professional attitude includes the following:

- Time Management – a professional is effective with time
- Accuracy – work must be double checked
- Clarity – clear and concise communication
- Courtesy – positive and constructive conduct
- Challenges – accept new challenges to develop skills & knowledge

## III.2 The Role and Responsibilities of Professionals to Employers & Clients

The most useful tool to review the role and responsibilities of a professional is through your Associations Code of Ethics. The Code of Ethics is a group of personal professional-conduct rules and includes 7 duties:

- Duty to society – always listed first and paramount.
- Duty to employers - remain fair, confidential and loyal
- Duty to clients – remain fair, confidential and loyal
- Duty to colleagues – courtesy and good will
- Duty to employees and subordinates
- Duty to the profession – maintain dignity and prestige of profession
- Duty to oneself – payment and safe work environment

Do not take the code lightly as it is the basis for discipline among your Association.

**NOTE** - the Obligation - Rudyard Kipling's Obligation of the Engineer and the Engineering Ring – is very different from the Code of Ethics. The Obligation is a voluntary commitment to high standards and the Code of Ethics requires high standards by Act, by Law.

### Conflict of Interests

Conflicts of the different interests in a given situation often come up in the exam. This is best illustrated with examples and below is a common example outlining conflicting interests and that discusses the appropriate actions.

Henry and Sally are both Professional Engineers in a long running business partnership called H&S Services. Henry sells his portion of the partnership to Sally so that Henry can pursue other interests. Henry soon joins a government organization responsible for awarding very large construction contracts very similar to what H&S Services executed.

To his surprise Sally soon sells H&S Services to a larger corporation called Big Deal Contractors. Sally now sits on the board of Big Deal Contractors. Six months later, Henry is presented with documents requesting the approval of awarding a multi million-dollar contract to Big Deal Contractors.

When considering Henry's obligations and suitable approaches we can model the situation as a conflict of interest. The interests that are in conflict include Henry's interest and duty to his employer as well as Henry's interest in a past business relationship with Sally.

One could easily imagine Sally's gain may influence Henry's engineering judgment. Henry has a significant duty to act in his employer's best interests so it is advisable that Henry announces the conflict of interests and removes himself from the process.

Be practical and realize that in some locations or situations the availability of capable professionals is limited. So conflicts of interest are occasionally tolerated and the risks mitigated by involving other professionals in the decision process.

### **III.3 Relations With Other Professionals & Non-Professionals; Business Practices**

Relations with non-professionals are discussed thoroughly in the Code of Ethics, specifically the duty to the public. However the most common relations with professionals includes communication (discussed in the professional attitude) and management. The various management styles include the following spectrum:

- Collegial – manager treats team as equals
- Team Orientated – manager sets goals, including team
- Interactive – manager consults team
- Responsive – manager presents tentative solution then consults team
- Paternal – manager presents decision & is open to serious objections
- Authoritarian – manager makes decision and explains
- Military – manager instructs team

### **III.4 Statutory & Non-Statutory Standards & Codes of Practice**

The Ethics text outlines a simple process for ensuring the safety of design as follows:

- Follow design codes and standards
- Be aware of safety regulations
- Make formal hazard analysis
- If cannot eliminate hazards, post warnings

Some of the statutory standards and codes include:

- Sale of Goods Act – conditions and warranties to protect the public
- Occupational Health and Safety – protects workers
- Standards Council of Canada

Non-Statutory standards and codes include those that are not federal or provincial such as ASHRA (American Society of Heating, Refrigerating and Air-Conditioning) or the various ISO standards. The courts see these standards and codes as a minimal acceptable level.

### **III.5 Risk Management, Insurance, Quality Management and Due Diligence**

Liability Insurance or “errors and omissions” insurance is taken to protect the professional from the costs of negligence. Typically the professional employee is covered by the employer’s insurance policy.

In addition, Engineers Canada administers a secondary insurance plan for engineers. The plan is termed secondary as other primary insurance plans must exist and must be exhausted first. This secondary insurance plan provides members \$100,000 of liability coverage, and unlimited legal fees.

The four steps to reducing hazards include:

- Eliminate known hazards
- Follow established design standards
- Follow laws and regulations
- Follow good engineering practice

Hazard Analysis is a final step of the design process and includes:

- Identify all hazards
- Eliminate wherever possible
- Shield users when hazards cannot be eliminated
- Warn, Remedy, Recall where shielding is not possible

## III.6 Environmental Responsibilities & Sustainable Development

The licensed professional has a duty to protect the environment. This duty is often clarified through the means of a guideline that is summarized as follows:

- Find and comply with environmental regulations
- Use specialists where not skilled
- Apply professional judgment
- Include costs of environment protection in evaluation
- Disclose information to protect the public
- Continually improved

CERES Environment Principles is an environmental guideline for corporations arising from the Exxon Valdez disaster. CERES is an acronym for the Coalition for Environmentally Responsible Economies.

ISO14001 is an Environment Management Systems Standard set forth by the ISO organization.

### III.7 Use of Software, Computers & Internet-Based Tools; Liability for Software Errors

A licensed professional cannot guarantee that designs or calculations will be 100% correct and designs are failure free. Yet, the professional must ensure they possess adequate knowledge, adequate skills and will apply the appropriate care. For software, all of the Associations hold the user responsible for the use of the computer-based outputs.

Good practice amongst the Associations is summarized below:

- Scope – know the limitation and accuracy of the software
- Validation – test the software (dummy runs, ~ checks, theory checks)
- Engineering Principles – examine and understand

**NOTE** – the licensed professional is responsible for program outputs and how they are used.

### III.8 Documentation Authentication & Control

The use of seals and stamps is a part of the authentication and control process; yet it is important to realize it is the last step of the approval process. The Ethics text suggests a documentation approval process as outlined below:

- Scope – does the work satisfy the scope?
- Accepted Practice – codes, standards, guidelines, proper theory
- Accuracy – logical and correct, proper transfer from other documents
- Completeness – is the work complete and in order?
- Format – accepted format

## Use of Seals and Stamps

### When do I get to stamp something?

*The stamp and signature signify that a licensed professional member of APEGA has accepted responsibility for the engineering or geoscience work represented in the authenticated document. A stamp is only issued to an individual who is qualified to practice engineering or geoscience in some capacity. The stamp is not a warranty or a guarantee of accuracy, however.<sup>1</sup>*

**Tricky Exam Material** – the seal remains the property of the Association and must be in the care and control of the engineer or geoscientist at all times. Also omitting the seal on final documents is an offence of the Act.

**Very Important – the seal must be signed and dated. AGAIN – the seal must be signed and dated.**

### What to stamp?

#### Yes

- Documents released to the public
- All final documents (drawings, reports,
- Final geological cross-sections or mappings
- Final engineering analysis or technical proposals

#### No

- Internal documents (your employer is not considered the public)
- Documents marked “for information” or “preliminary”
- Company logos or Business cards
- Contracts or scope checklists
- Your newborn

## Permit to Practice

Any firm (companies, partnerships, corporations) offering engineering or geoscience services to the public must have a Permit to Practice – a license issued by the Association. The Permit Number (no longer a seal) must be affixed to documents to ensure the public by ensuring the firms licensed professionals are identifiable and qualified.

**UPDATE – March 2012 – the permit number is no longer required and is considered optional.**



**Tricky Exam Material** – you cannot use your seal or your Permit to Practice number in any form of advertising.

### III.9 Duty to Inform; Whistleblowing

In the case of a serious dilemma created by unsafe, unethical or illegal activities, the professional typically has three options:

- Internal Correction – most simple and effective action; first choice
- Whistle Blow – often effective but a last resort due to repercussions
- Resign – in protest; but does this protect the public?

**Tricky Exam Material** - approaching your Association with the illegal act does not constitute whistleblowing since the information is not made **public**.

**Tricky Exam Material** - a troublemaker differs from a whistleblower in two important ways:

- Method – a troublemaker typically leaks information anonymously
- Motive – a troublemaker leaks for personal gain and not public protection

### III.10 Communication

An important point to remember is that your Association expects that you are able to communicate effectively and professionally with a number of methods such as:

- Formal reports
- Design scopes
- Basic contracts
- Drawings
- Oral presentations

All of these methods may be used to communicate with peers, management or the public.

**Red Hot Exam Tip** - a method your Association employs to ensure a thorough understanding of communication is by utilizing challenging language in the exam. A firm grip of the English language is worth a significant portion of the exam and native speakers, with a good vocabulary, have a definite advantage

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<sup>1</sup> Practice Standard for Authenticating Professional Documents, v 3.1, APEGA, 2013