



Licence Requirements

Academics and Experience



Professional Engineers
Ontario



What is Professional Engineering?

Professional Engineering : three part definition

- Any act of planning, designing, composing, evaluating, advising, reporting, directing or supervising
- That requires the application of engineering principles
- And safeguards life, health, property, economic interests, public welfare or the environment.



A Professional Licence

Through the Professional Engineers Act, Professional Engineers Ontario governs licence and certificate holders and regulates professional engineering in Ontario to serve and protect the public.

Established on June 14, 1922, Professional Engineers Ontario (PEO) is the licensing and regulating body for engineering in the province. It fulfills the same role for engineers as the College of Physicians and Surgeons for doctors or the Law Society of Upper Canada for lawyers.



Licence Requirements

Good Character

- Self declaration on application form
- Referees' comments

Academics

- CEAB accredited degree
- ARC review

PPE

- Professional Engineers Act
- Ethics

References

- Contact information supplied by applicant
- Must cover all work experience

Experience

- Experience summary provided by applicant



Academic Requirements

The applicant must:

- hold an undergraduate engineering degree from a Canadian Engineering Accreditation Board (CEAB) – accredited program.
- or possess equivalent qualifications.



Minimum Requirements

- Three year engineering technology program
- Three year university science program in a relevant engineering field.

Applicants who meet the minimum requirement but do not have a Bachelor of Engineering degree may be required to write up to 18 examination and submit an engineering report.



Academic Documents

Transcripts

- Canadian and US academic transcripts must be received directly from the issuing institution.
- Original transcripts, diplomas, degrees and or certificates from non-CEAB accredited programs (copies of originals may be accepted if the copies are signed and certified as a true copy by a Canadian Professional engineer or a notary public of Ontario).
- English translations prepared by a member of ATIO or a Canadian professional engineer who certifies that he/she is fluent in both languages.



Academic Documents

Others

- Abstracts of theses for post graduate degrees.
- English translations of course descriptions of the subjects taken during the entire engineering education.

**What if my program is not CEAB
- accredited?**



The Academic Requirements Committee (ARC) will review the transcripts and course descriptions with respect to an equivalent CEAB accredited program.

The ARC may assign an examination program based on their assessment of the “equivalency” of the program with respect to both the depth and breadth of the academic education .



Engineering Disciplines

Agricultural/Biosystems/Bioresource/Food Eng'g

Biomedical/Biochemical Engineering

Building Engineering

Chemical Engineering

Civil Engineering

Computer Engineering

Electrical Engineering

Engineering Physics

Environmental Engineering

Forest Engineering

Geological Engineering

Geomatics Engineering

Industrial Engineering

Manufacturing

Marine Engineering

Materials Engineering

Mechanical Engineering

Metallurgical Engineering

Mining and Mineral Processing Eng'g

Nuclear Engineering

Naval Architectural Engineering

Petroleum Engineering

Software Engineering

Structural Engineering

Space engineering

Transportation Engineering

Water Resources Engineering



Exam Programs

Confirmatory Exam Program

- The academic background appears to be “equivalent”.
- The exam program “confirms” depth of knowledge.
- Consists of two exams from Group A professional
one exam from Group B professional
one complementary exam.
- Applicant may choose which exams to write.
- If applicant has more than 5 years of work experience, may be invited to an ERC interview.



Exam Programs

Directed Confirmatory Exam Program

- The academic background appears to be “equivalent” with minor deficiencies.
- The exam program “confirms” depth of knowledge.
- Consists of two exams from Group A professional
one exam from Group B professional
one complementary exam.
- Applicant must write directed exam(s) and may choose the other(s).
- If applicant has more than 5 years of work experience, may be invited to an ERC interview.

What is an ERC interview?



The Experience Requirements Committee (ERC) may interview an applicant to decide if the applicant can demonstrate, through his/her experience, that he/she has applied engineering fundamentals to a degree that would be expected of an engineer.

This interview must explore the “depth” of the knowledge but also ensure the “breadth”.

The ERC may recommend that exams are waived if the applicant demonstrates sufficient knowledge and application of the engineering fundamentals.

Specific Exam Program

- The academic background does not appear to be “equivalent”.
- The exam program addresses the specific deficiencies.
- If applicant has more than 10 years of work experience, the applicant may be invited to an ERC interview.
- The ERC interview will address the exam topics as described in the CEQB syllabus.
- The ERC may recommend that exams are waived.



Addressing the Exams

Confirmatory and Directed Confirmatory

- Bridging program – Ryerson
- Interview with ERC (> 5 years of engineering experience).
- Write examinations.

Specific Exam Program

- Must write basis studies exams first.
- Interview with ERC (>10 years of engineering experience).
- Write examinations.
- Take preapproved courses in lieu of PEO exams.



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PPE

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References

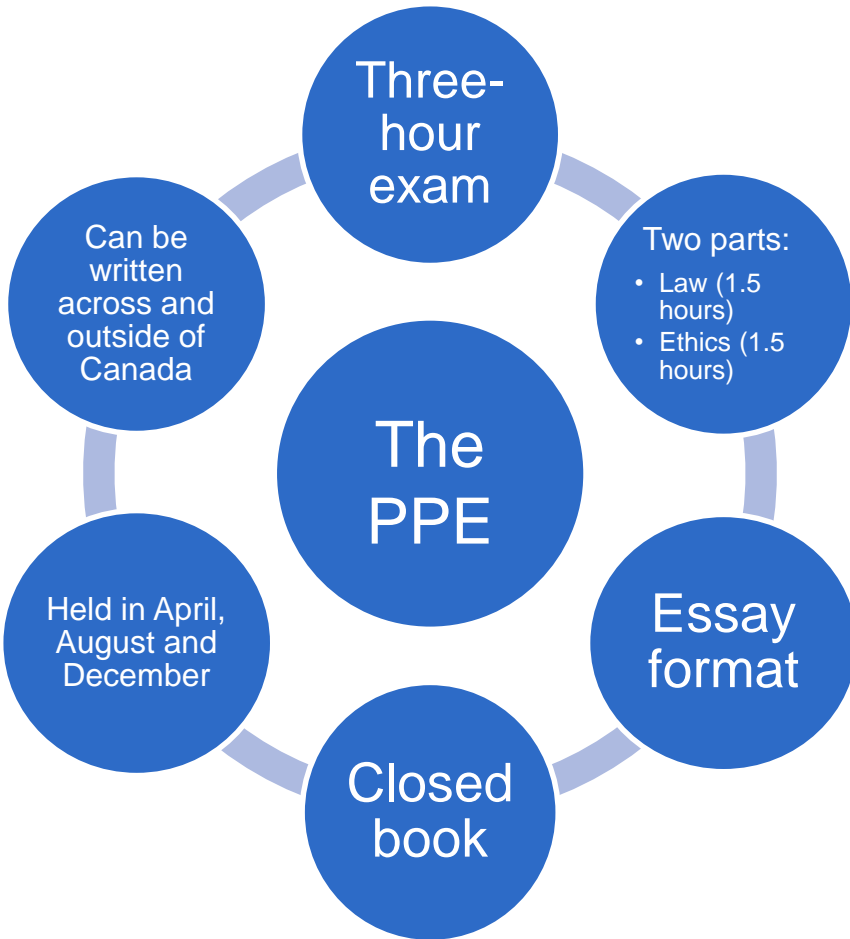
- Contact information supplied by applicant
- Must cover all work experience

Experience

- Experience summary provided by applicant



Professional Practice Exam



All applicants must pass the PPE (minimum mark of 50 percent)

Only failed portions have to be re-written (law or ethics)



If the PPE is failed three times, candidate must wait one year before a fourth and final attempt to write the exam is granted

- Applicant must submit two sample responses from past exams for PEO to review before fourth and final attempt



Good Character

- Self declaration on application form
- Referees' comments



Academics

- CEAB accredited degree
- ARC review



PPE

- Professional Engineers Act
- Ethics



References

- Contact information supplied by applicant
- Must cover all work experience

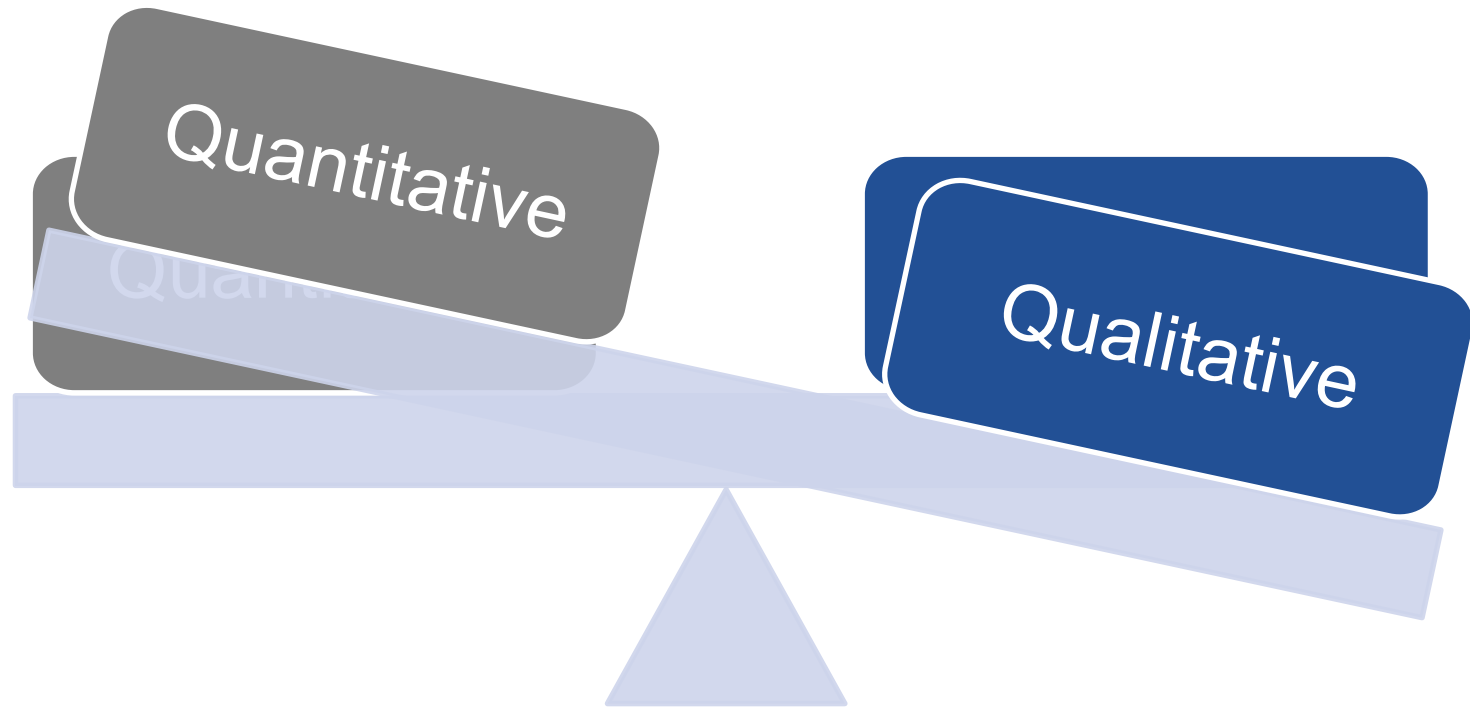
Experience

- Experience summary provided by applicant



Experience Requirements

Two main requirements



Experience

How much experience do I need?





Quantitative Requirements

- **Minimum of 48 months** of acceptable experience of which **at least 12 months** must be acquired in a Canadian jurisdiction supervised by a person legally authorized to practice in that jurisdiction.
(i.e. professional engineer)

■ Pre-graduation Experience

- Eligible for up to 12 months credit maximum.
- After completing 50% of course work.
- **Not** eligible for the required 12 months of Canadian experience.
- Must be related to engineering discipline and career.



Credits con't

■ Post Graduate Degree

- Completed degree usually credited for 12 months engineering experience.
- **Must** be in same discipline or closely related to your bachelor of engineering degree.
- Only one credit (not 12 months for each degree).
- **Not** eligible for the required 12 months of Canadian experience.



Credits con't

- Applicant may receive additional work experience credits for postgraduate degree(s) – related industrially applied research providing that it meets the 5 quality based experience criteria.
- The **maximum** credit for this research may **not exceed** 12 months for a doctoral degree and six months for Master's degree.
- No additional experience credit is given for over time work.

Experience

What type of experience do I need?





Qualitative Requirements

What makes it acceptable?

- Application of Engineering Theory
- Practical Experience
- Management of Engineering
- Communication Skills
- Awareness of the Social Implications of Engineering

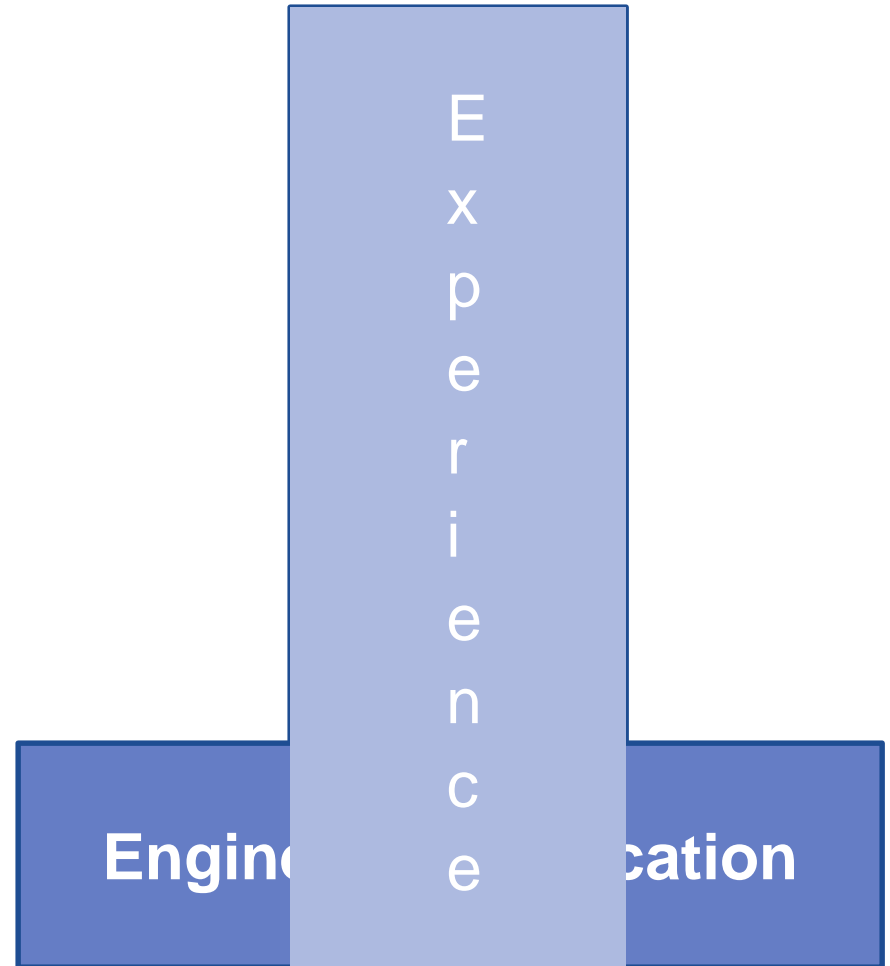


Application of Theory

Do I need my engineering studies to do my job?

If so, how?

Link your work to your academics; refer to specific engineering principles.





Application of Theory

- **Analysis:** *scope, operating conditions, performance assessments, safety and environmental issues, technology assessment, economic assessment, reliability analysis.*
- **Design:** *functionality, product specification, component selection, integration of components into larger system, reliability and maintenance factors, environmental, quality improvements.*



Application of Theory

- **Testing Methods:** *devising testing methodology, techniques, verifying specification, new product or technology commissioning.*
- **Implementation Methods:** *applying technology, engineering cost studies, optimization techniques, process flow and time studies, cost/ benefit analysis, environmental issues and recommendations, maintenance and replacement evaluation.*



Application of Theory

Questions:

- What were the important parameters to consider?
- What were the options available to you?
- How did you make your decision?
- Who did you consult and how much assistance did you need?
- Why was the selected method appropriate?



Practical Experience

- **Function of Components as Part of Larger System:** *merits of reliability, role of computer software, relationship of end product to equipment and control systems.*
- **Limitations of Practical Engineering:** *production methods, manufacturing tolerances, operating and maintenance philosophies.*
- **Significance of Time:** *workflow, scheduling, corrosion rates, replacement scheduling.*
- **Codes, Standards, Regulations, Laws**



Practical Experience

- Questions:
 - What considerations did you have to make due to real world conditions?
 - What codes and standards did you use as part of your engineering work?
 - Why was it necessary to refer to these – what is the basis for them?
 - How did limitations of time, material, personnel etc. affect your engineering work?



Management of Engineering

- **Planning:** *identifying requirements, developing concepts, evaluating alternative methods, required resources.*
- **Scheduling:** *establishing interactions and constraints, activity schedules, impact of delays, interaction with other projects.*
- **Budgeting:** *conceptual and detailed budgets indentifying labour, materials, overhead, cost escalation.*



Management of Engineering

- **Supervision:** *leadership and professional conduct, human resources, motivating teams .*
- **Project Control:** *coordinating phases of project work, monitoring expenditures and schedules and taking corrective action.*
- **Risk Assessment:** *operating equipment and system performance, technological risk, product performance, social and environmental impacts.*



Management of Engineering

- Questions:
 - How do these concepts fit into the engineering work that you did?
 - Are you responsible for controlling any of these that affect other members of the team?
 - Have your responsibilities increased in this area?



Communication Skills

- **Written Work:** *correspondence, design briefs, major reports.*
- **Making Oral Reports:** *coworkers, supervisors, senior management, clients, regulatory authorities.*
- **Making Presentations to the Public**



Communication Skills

- Questions:
 - How do you report your work?
 - Are there any written reports? Who receives these?
 - Opportunities for presentations?
 - Any examples of having to promote your engineering ideas?



Social Implications

- Value or Benefits to the Public
- Safeguards in Place
- Relationship between Engineering and the Public
- Role of Regulatory Agencies



Social Implications

- Questions:
 - What are the potential effects - positive or negative - of the engineering project?
 - How are the negative effects mitigated?
 - Who are the end users of the engineering work? Were they consulted on the project?
 - What involvement did you have in the process?



Experience Assessment

Tools Used

- Summary of experience provided by the applicant (may include earlier EIT reviews and responses by applicant).
- Referees' evaluations covering all reported time periods (may also include follow up discussions with referees).
- Interview with an Experience Requirements Committee (ERC) panel.



Experience Summary

- Reverse chronological order.
- Include start date (month and year) and end date (month and year) of each job.
- Include all employers' names and addresses (including country) for each period to be assessed.
- Should include a clear summary of your engineering example.
- Use a narrative style – “I” not “we”.





Experience Summary

- Provide specific examples or projects that you have worked on.
- Describe one example per form.
- You may provide more than one example per employer.

***One example proves you can do it,
Two examples prove the first time wasn't a fluke,
Three examples prove this is a consistent competency.***



Sample Layout

EXPERIENCE RECORD FORM

Current Date: _____

Name: _____ File: _____

Telephone (H): () _____ Email Address (H): _____

Telephone (B): () _____ Email Address (B): _____

ENGINEERING EXPERIENCE SUMMARY	
Company Name and Address (include Country)	
Length of Employment Start date (MM, YYYY) to end date (MM, YYYY)	
Position Title	
Job Responsibilities and Engineering Duties	
<i>Provide a brief description of your engineering duties.</i>	
Application of Theory	
<i>Describe how you have applied engineering fundamentals in analysis, design, synthesis, testing methods, implementation methods.</i>	
Practical Experience	
<i>Describe your practical engineering experience in relation to the function of components as part of a larger system, limitations of practical engineering, significance of time in the engineering process, knowledge and understanding of codes, standards, regulations and laws</i>	
Management of Engineering	
<i>Describe situations involving planning, scheduling, budgeting, supervision, project control, risk assessment.</i>	
Communication Skills	
<i>Describe how you communicated your engineering ideas through written work, oral presentations, presentations to the general public.</i>	
Knowledge of the Social Implications of Engineering	
<i>Describe situations involving the benefits of the engineering work to the public, safeguards, the relationship between the engineering activity and the public, the role of regulatory agencies.</i>	



Sample Layout

EXPERIENCE RECORD FORM

Current Date: _____

Name: _____

File: _____

Telephone (H): () _____

Email Address (H): _____

Telephone (B): () _____

Email Address (B): _____

ENGINEERING EXPERIENCE SUMMARY

Company Name and Address (include Country)

Length of Employment

Start date (MM, YYYY) to end date (MM, YYYY)

Position Title

Job Responsibilities and Engineering Duties

Provide a brief description of your engineering duties.

Application of Theory

- Provide a general description of your engineering duties and responsibilities.
- Provide a brief description of the engineering example or project you want to write about and provide a timeline for this project.
- For example “ This project involved the design of a chemical plant for a west coast pulp mill. The project lasted 13 months and is typical of my work with this company”

Describe situations involving the benefits of the engineering work to the public, safeguards, the relationship between the engineering activity and the public, the role of regulatory agencies.



Describing Your Work

- Focus on what you did as it relates to the 5 criteria.
- Structure your description to include:

WHAT you did

I calculated the total heat load on the reactor

HOW you did it

Using the theoretical heat of reaction

WHY you did it

In order to size the heat exchanger.



Describing Your Work

WHAT

HOW

WHY



Example #1

- “Much of my daily work falls within the mechanical contractor’s scope of supply for HVAC equipment. We provide a complete specification which clarifies material composition and specific mechanical components.”
- No specific example.
- Uses “we” – don’t know what the individual did.
- States “what” he/she did only – no “how” or “why”



Example #1 cont.

- As part of the HVAC supply for XYZ company, I provided complete specs including the material composition and specific mechanical components.
- Due to the corrosive nature of the fluids, I selected a pump with a 316 stainless housing and impeller and double mechanical seal. When compared to carbon steel and 304, this material had greater resistance to corrosion and performed better under high temperatures. This would allow longer time between maintenance shutdowns



Example #1 cont.

- I calculated the head requirement of the pump keeping in mind the NPSH and the friction losses at the design flow rate for the piping material. I reviewed the piping layout to discover the length and number of joints in the piping run. During this review, I also made sure that there was a proper slope to the line to ensure drainage.
- keep asking “why?” and “how?” to ensure that you have provided sufficient detail
- Provide actual examples, show decisions



Example #2

- “I inspected the parking garage and noted cracks in the support columns. I provided the client with recommended repair strategies.”
- Not enough detail about a specific example – what is involved in an inspection?
- How was the recommendation made? Based on what knowledge?
- Structural analysis? Safety?



Example #2 cont.

- I conducted a thorough visual inspection of all components of the parking garage including partial dismantling of certain sidings in order to verify the condition of components behind, exploratory cuts in masonry cladding.
- I discovered cracks in the support columns.
- After careful analysis of the cracks, and the surrounding area, I determined that they were a result of a water infiltration. This was evident because of.....



Example #2 cont.

- I did a stress analysis of the support column using information gained from radiography analysis in order to determine if it was still sound.
- Based on the structural analysis, the proper repair method was....This method would allow....
- Shows analysis beyond just visual – subjective?
- Ensures safety of structure – confirmation calculations
- Based on structural analysis, an appropriate repair strategy is developed.



Referee Requirements

- Need your direct supervisor from each employer (job) covering the time of employment.
- Need one P. Eng. supervisor for a minimum of 12 months.
- Need a minimum of 3 referees (may require more depending on number of employers).



Referee Requirements

- Ideally, one P.Eng. supervisor and another P. Eng. familiar with your work for each place of employment for the entire 48 months.
- All referees **must be sufficiently familiar** with the details of your work, either through direct supervision or ongoing contact, to be able to confirm that the work experience qualifies within the five quality based criteria.



Referee Examples

If you have had 3 employers:

- 3 direct supervisors
- A P.Eng for a minimum of 12 months (if not one of the above).

If you have had 1 employer:

- Direct supervisor
- A P.Eng for a minimum of 12 months
- One other (coworker, client...)

If you have had 5 employers:

- 5 direct supervisors
- A P.Eng for a minimum of 12 months

Interviews are required only when experience

- Doubtful: *cross discipline, selling/ marketing, patent, teaching, researching, project management, supervision, maintenance and operations, quality related work , Military experience... etc.*
- Unsuitable: *technician, technologist, work that does not require application of engineering principles*

PEO's concern: Work experience is not in compliance with educational background.

- Must provide evidence of educational courses or training to bridge the gap between your educational background and the work done.



Quality Assurance and Quality Control

PEO's concern: Inspections/ testing for verification purposes only is a technician's level.

Applicant must demonstrate involvement with the following:

- Process design modifications as a result of findings of non-conformances, including application of engineering analysis or calculations.
- Failure and stress analysis of products/ processes.
- Development of control plans and identification of critical attributes to be controlled during product life cycle.

PEO's concern: Little or no requirement for engineering expertise and/or little opportunity to work independently.

- Must provide specific examples of hands-on involvement and contribution to solving engineering problems including design work and professional advise in the selection of equipment, products or process parameters.
- Must describe engineering thought processes.

PEO's concern: business role that does not requiring engineering training.

- Must provide specific examples of solving engineering technical problems rather than delegating all technical issues.
- Must provide specific examples of design review including engineering analysis and calculations.

Work experience exclusively in the area of operations and maintenance will frequently fall short of requirements for licensure.

Consideration will be given to the following types of experience:

- Design, development or upgrading product or process specifications, preventative action plans and maintenance programs.
- Engineering analysis of equipment/ process failure.



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- Ethics



References

- Contact information supplied by applicant
- Must cover all work experience



Experience

- Experience summary provided by applicant



- Academics & Educational Requirements

- academics@peo.on.ca

- Experience Questions & Assessment

- experience@peo.on.ca

- Examinations (Technical & PPE)

- exams@peo.on.ca

**PROFESSIONAL
ENGINEER**

**Please Stand Back
While I Work
My Magic**

Finance Department

- financialservices@peo.on.ca

- Engineering Intern (EIT) Program

- eit@peo.on.ca

