

# Competency-Based Assessment (CBA) for Engineers-in-Training

Winter 2019

Tina Maki, P.Eng., Director of Special Projects

Ensuring public safety



## Outline

1. Does CBA apply to me
2. What is CBA
3. CBA requirements
4. System features
5. Tips
6. Role of supervisors
7. Q&A

Ensuring public safety



## CBA effective Jan 1, 2019

- Affects professional engineer applicants (i.e., engineers-in-training)
- What constitutes acceptable engineering experience is not changing, we are better defining it
- More quantitative, precise, objective, transparent, consistent measuring system
- Increases the confidence of all who participate in the process: applicants, validators, employers, assessors

Ensuring public safety



## Transition from the current system – pg 1

- Use the new CBA system if, as of Jan 1, 2019:
  - current engineer-in-training, no experience reports received at APEGS in the paper-based system
  - applied to APEGS as engineer-in-training on or after Jan 1, 2019

Ensuring public safety



## Transition from the current system – pg 2

- Given the choice to use the paper-based or the new CBA system if, as of Jan 1, 2019:
  - current engineer-in-training\* and APEGS has received one or more experience reports in the paper-based system
    - \*or engineer-in-training applicant, int'l grad, has experience review option to waive confirmatory exams
  - however, you are encouraged and invited to switch to the new CBA system

Ensuring public safety



## Transition from the current system – pg 3

- If you have the choice and you choose to continue in the paper-based system, you do not need to submit the rest of your reports by Jan 1, 2019
- Example scenarios...

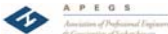
Ensuring public safety



7

## How to switch to CBA system


- Current engineers-in-training who have already submitted one or more reports in the paper-based system:
  - Copy and paste any info from those reports that you want to be considered into the appropriate spots in the online system
  - The ERC will not refer to your previously submitted, paper-based experience reports when doing your CBA assessment
  - Switching does not mean you have lost previously granted experience credit toward professional registration

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

8

## What Is Competency-Based Assessment?


- Competencies are observable and measurable skills, knowledge, abilities, motivations or traits required for professional registration
- Demonstrated through the actions and behaviours of the applicant

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

9

## Why we assess experience


- Prior to being granted a licence, must demonstrate ability to practice engineering
- The onus is on the applicant to provide evidence that they possess, through experience, the capability to practice engineering at a professional level
- Self-regulation: peer review system
  - Put in your full effort

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

10

## Other requirements (unchanged)


- 4 years of experience minimum
  - Tallied from the brief, chronological Employment History provided in the online system
- Minimum 1 year in a Canadian or equivalent-to-Canadian environment
- Maximum 3 years credit for international and graduate studies combined
  - Cdn grad studies does not count for the Cdn experience requirement

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

11

## Eligible experience (unchanged) – pg 1


- All post-bachelors experience is eligible
- Up to 1 year of pre-grad
  - From after half of degree completed
  - Close professional oversight required
  - Technologist experience prior to completing bachelor degree

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

12

## Eligible experience (unchanged) – pg 2

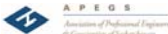
- Up to 24 months for graduate studies:
  - 12 months for thesis-based Masters (M.Sc.)
  - 24 months for PhD
    - 24 months only if went straight from bachelor program into PhD program
    - Normally 12 months is granted because most people do a Masters
  - Enter graduate studies as a period of employment in the Employment History table

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

13

### Eligible experience (unchanged) – pg 3


- Engineering work while doing graduates studies including:
  - Teaching Assistant / Research Assistant work not related to your M.Sc/PhD thesis or M.Eng. project.
  - Concurrent employment outside the university setting
  - entered as separate employment periods in the Employment History even though the time periods might overlap

*Ensuring public safety* 

14

### Eligible experience (unchanged) – pg 4


- Teaching of engineering
  - include the applicable content of what you taught in order to demonstrate a competency
  - include the name of the course you taught and details on the applicable part of the course that fulfills the competency and how that content is applied in a real-world situation (the outcome
  - See the Guide for more detail...

*Ensuring public safety* 

15

### CBA Framework

- 34 competencies
  - 7 categories
  - 1 example required per competency chosen from any of your past experience. Each passed once.
- Indicators for each competency - guidance on example content that will demonstrate the competency
- Rating scale 0-5
- Interim submission
- Final submission

*Ensuring public safety* 

16

### Competency Categories


Category #	Category name	# of competencies
1	Technical competence	10
2	Communication	3
3	Project and financial management	5
4	Team effectiveness	2
5	Professional accountability	6
6	Social, economic, environmental and sustainability	5
7	Personal Continuing Professional Development	3

*Ensuring public safety* 

17

### Competency Rating Scale – p1


- 6 levels of competence (0-5)
- Minimum rating of 1 for each competency individually to pass it, plus:
- Minimum average of either 2 or 3 for each category, depending on the category

*Ensuring public safety* 

18

### Competency Categories – Min. Avg. Ratings

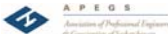
Category #	Category name	Min. Average
1	Technical competence	3
2	Communication	3
3	Project and financial management	2
4	Team effectiveness	3
5	Professional accountability	3
6	Social, economic, environmental and sustainability	2
7	Personal Continuing Professional Development	3

*Ensuring public safety* 

19

## Competency Rating Scale – p2

- Competency Rating Scale (condensed):
  - 0 – little or no exposure to the competency
  - 1 – general appreciation and awareness
  - 2 – knowledge and understanding of objectives, uses standard engineering methods, limited scope and complexity**
  - 3 – moderate scope and complexity**
  - 4 – responsible, varied assignments, working at a professional level
  - 5 – mature professional level, independent

*Ensuring public safety*  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

20


## Competency Example

- Technical competency 1.4:  
“Apply engineering knowledge to design solutions.”

Indicators (for guidance only. Just one actual example required):

1. Prepare technical specifications
2. Demonstrate use of theory and calculations to arrive at solutions
3. Demonstrate the development of a unique design solution which could not be accomplished with a standard design solution


Note: the same project can be used several times for various competency examples

*Ensuring public safety*  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

21

## Competency Example Components


- Situation
  - A brief overview of a specific situation or problem
- Action
  - Actions taken in the situation, including engineering judgments made or solutions found.
  - Typically the longest portion, has most of the details
- Outcome
  - The impact that your actions, solutions or judgments generated

*Ensuring public safety*  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

22

## Validators – pg 1


- Are normally the supervisors, whether they are a professional or not (P.Eng., P.Geo., Engineering Licensee, Geoscience Licensee or equivalent)
- With prior APEGS approval, may also be colleagues, clients or consultants with first-hand knowledge of the work experience
  - At least one Validator must be a direct supervisor and share your discipline of practice
- A **minimum of four** individuals who verify and provide feedback on the experience.

*Ensuring public safety*  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

23

## Validators – pg 2


- Minimum of two must be P.Eng., P.Geo., Engineering Licensee, Geoscience Licensee (or equivalent)
- You need one Validator per competency
  - One Validator can verify multiple competencies
- Combined, the Validators’ first-hand knowledge covers as much of the experience as possible but a minimum of 4 yrs\*
  - \*exception: 5 yrs for “Academic Review Cases” (international grad applicants who have been given the experience review option to waive confirmatory exams)

*Ensuring public safety*  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

24

## Validators – pg 3

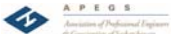
- Validators who verify specific competency examples must have direct personal and professional knowledge of that experience
- Some Validators may not be given specific competencies to verify but provide input in the overall feedback section only
  - For example, co-op work term supervisors - allows them to comment on and confirm the employment occurred

*Ensuring public safety*  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

25

## Validators – pg 4

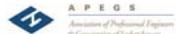
- No longer required (from the paper-based system): P.Eng./P.Geo. mentor when the supervisor is not a P.Eng. (or equivalent)
- Side note: Validator feedback will also serve as references for your P.Eng. application (3 required)
  - Include their names on your P.Eng. application (separate from the CBA system)
  - Validators from the CBA system who you nominate as references will not be contacted again
  - References not included in your CBA submission will be emailed a reference form directly from APEGS staff

Ensuring public safety  APEGS  
Association of Professional Engineers & Geoscientists of Saskatchewan

26

## Online submission – NEW!

- “Engineering Competency Assessment System”
  - <https://competencyassessment.ca>
- Developed by Engineers & Geoscientists BC for use by other regulators in Canada
- APEGS applicants are managed directly by APEGS (Eng&GeoBC is our software provider)
- Create an account, use APEGS registration / file #
- Account verified directly with APEGS

Ensuring public safety  APEGS  
Association of Professional Engineers & Geoscientists of Saskatchewan

27

## Engineering Competency Assessment System




Ensuring public safety  APEGS  
Association of Professional Engineers & Geoscientists of Saskatchewan

28

## Online Submission - Process


1. The Engineer-in-Training (or applicant) enters employment history, validator info, competency examples, self-rating
  - When all done, selects “Submit”, validators receive automatic email with a link
2. Validators rate each example, provide comments and answer a set of additional feedback questions
  - Option to provide feedback to the applicant and/or recommend edits
  - Comments and ratings are only visible to Assessors and APEGS staff
3. APEGS staff is automatically notified that all entries are completed and validated, then assigns Assessors
4. Assessors from Experience Review Committee (ERC) enter comments and ratings

Ensuring public safety  APEGS  
Association of Professional Engineers & Geoscientists of Saskatchewan

29

## Interim Submission


- At approximately the two years of experience mark (including one year of pre-grad experience, if applicable)
- Benefits the applicant
  - Ensures acceptable experience (feedback from ERC)
  - Ensures correct writing style and type of information required
  - **PREVENTS RE-SUBMISSIONS** – more likely if no interim submission done
  - Prevent delay in professional registration
- Benefits Validators and Assessors
  - **RE-SUBMISSIONS MEAN RE-WORK FOR VALIDATORS AND ASSESSORS**

Ensuring public safety  APEGS  
Association of Professional Engineers & Geoscientists of Saskatchewan

30

## Interim Submission – How To

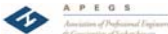
- Complete a minimum of 3 competency entries, at least one of which is from Category 1 - Technical Competence
  - Do more than 3 if you wish
- The applicant clicks Submit for the online system to send notice to the validator(s) that the completed competencies are ready for validation
  - The system allows for validator feedback to the applicant until there is agreement between the two of you
- Applicant notifies APEGS by email that they have an interim submission ready. **NOTE: this step is not currently automatic in the system for interim submissions**

Ensuring public safety  APEGS  
Association of Professional Engineers & Geoscientists of Saskatchewan

31

## Interim Submission – What ifs, pg 1


- If I have a better example for my final submission than the one I entered for my interim submission, can I redo that competency?
  - Yes. You would email APEGS staff and tell us the specific competencies you want re-opened. Once complete, they would be sent for re-validation by the system as normal.
  - However, **if you passed that competency already, it's not necessary to redo it** even if you have a better example later.

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

32

## Interim Submission – What ifs, pg 2


- If I didn't do an interim submission at the two year mark, can I still do an interim submission any time after that?
  - Yes and it is highly recommended. An interim submission can still be done at any time prior to completing all of your competency entries to confirm you are writing them correctly
  - This also accommodates applicants who apply with more than 4 years of experience

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

33

## Tips – pg 1


- Be very specific in describing the work
- Identify your role – first person singular (“I” followed by action you took)
- Do not use general, vague statements that do not refer to specific projects and the work you did
- If confidentiality of a project is required, substitute project names and locations with surrogate names (for example, Project X located in Town Q) as long as the Validator knows which project you're referring to

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

34

## Tips – pg2


- DO NOT use words such as “assisted”, “involved with” or “participated” or similar general references to your work because these are not specific enough in identifying the work you did personally
- Point form is permitted

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

35

## Sample Actions – not passed


- Determined (*who determined?*) the scope of proposed HVAC projects and estimated corresponding energy loads to confirm the projects were within existing system capacity and wouldn't cause negative effects from the technological point of view.
  - No specifics, no picture formed in the mind of the Assessor
- I installed (*probably not!*) various new facilities on diverse existing HVAC/boiler systems. Through these projects, I obtained hands-on work experience and solid background for my future engineering work.
  - No specifics, no picture formed in the mind of the Assessor
  - The last sentence is fluff, no contributory information

Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

36

## Competencies not passed – what happens

- An assessment by 3 Re-Assessors is automatic prior to the decision being confirmed
- Applicants are always given the change to re-submit
  - Details of the concerns are provided
  - Most often the applicant did an unacceptable job of reporting an acceptable example
- Upon assessment of the re-submission, either the competency is accepted or the applicant will have to use another example from other work experience or gain additional experience to satisfactorily complete a Competency Category


Ensuring public safety  APEGS  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

37

## Role of Supervisor (Validator)

- Guides the development of the applicant into a technically capable professional
- Conveys understanding of the relationship with the employer/client, the professional Association and society
- Obligation to give fair and professional criticism when warranted (Code of Ethics)
- Be ethical, fair and impartial (even if there is a personality conflict)

*Ensuring public safety*




38

## Role of Supervisor (Validator), cont'd

- Employers are encouraged to offer a full range and progression in responsibilities so experience and exposure is gained in all areas
- Submission review and sign off (via personal login)
- Include comments please! **Comments are not visible to the applicant**
- Suggestions for improvement are facilitated through the online system. Experience writing is a learning opportunity too

*Ensuring public safety*




39

## Role of Supervisor (Validator), cont'd

Comments might include things like:

- Confirms that examples are accurate (indicate if engineer-in-training's role was over-stated or under-stated)
- Level of guidance required (minimal, as expected, extensive)
- Extent to which engineer-in-training was responsible for producing the outcomes
- Complexity of the context wrt typical work-related situations experienced by professional licensed engineers and geoscientists
- Consistency of engineer-in-training behaviour in the performance of their work, noting positive or negative trends

*Ensuring public safety*




40

## Role of Supervisor (Validator), cont'd

Comments might include things like:

- The impact the engineer-in-training had on the organization and the people involved
- Further detail the engineer-in-training missed (however engineer-in-training ideally adds that detail themselves)

*Ensuring public safety*




41

## Eligibility to write the PPE

- Must be registered as a member-in-training in good standing
  - Also need this in order for APEGS to assess experience
- Interim CBA submission submitted to APEGS completed in full (does not have to be approved yet) by the PPE application deadline

*Ensuring public safety*




42

## For full details on CBA:

- This presentation does not cover everything you need to know for a successful CBA submission.
- Refer to the *Competency Assessment Guide on [www.apegs.ca](http://www.apegs.ca)* under:
  - Members, Competency-Based Assessment
- Engineering Competency Assessment System:
  - <https://competencyassessment.ca>

*Promoting and improving proficiency and competency*





**APEGs is bringing  
Dream Big to every  
school!**

**Sign up to introduce  
the show for Engineering  
and Geoscience Week,  
March 3 to 9, 2019.**

*Promoting and improving  
proficiency and competency*

**APEGs**  
Association of Professional Engineers  
& Geoscientists of Saskatchewan

The graphic features the text 'DREAM BIG' in large, bold, blue letters, with 'ENGINEERING OUR WORLD' written below it. The background is a blue and white abstract design with a silhouette of a person reaching up.

44

## Questions



44

A 3D white figure is standing next to a large, orange question mark. The figure has its hand on its head, suggesting a state of confusion or deep thought.