The Pathway to Professional Engineering Licensure– Dispelling the Myths in Becoming a Professional Engineer!
A Panel Discussion

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2 PM EST
To whom it may concern...

• Practitioners
• Academics
• Students
Myths identified

• Practitioners
  – My industry requires certification in 6-sigma, TQM, CPI, RIE, factory physics, black belt, lean, PMP, etc – no one recognizes the PE – what does it cover?
  – I have not worked for any PEs – I cannot get my experience certified
  – It’s been too many years and I haven’t taken the FE
  – Not necessary – nobody has one – not needed in my industry
  – Too risky at this stage of my career – I can’t pass the test
  – Too risky – insurance, etc. – why expose myself or employer to the risk?
  – What for – I don’t need to seal anything
  – Do I have to live in state where I practice?
  – My practice is primarily international – this has little to no bearing
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• Academics
  – What for – no bearing on tenure and promotion?
  – It is not my job, takes too much airspeed and altitude
  – ABET not asking for it, so why the concern?
Myths identified

• Students
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  – Too many topics and I blew *Thermo*
  – No body asking for it, employers asking for specific certifications not PE
  – It’s really for civil and mechanical
  – Fear of failure
Professional Engineering Licensure

• Why Licensure?
• Why is it Important?
• State Requirements?
• What is required to become licensed?
• How Do I become licensed?
The Future

• Do you know what you will do when you graduate?

• What are you doing next year?
  – Future Uncertain—Why take a chance on the known?

• 5-10-20 Years from Now?

• Career Professionalism you know what you’ll do when you graduate?

• Where do you see yourself in five years?

• What about 10 years? 20? 30?
Current situation

• Only a very small fraction of BSIE holders become PEs
  – Starts with few seniors taking the FE
• Fewer faculty teaching the next generation of IEs have a PE
• A common **notion** is that IEs don’t need to be registered because state law doesn’t force it like Civil Engineering
• It is **thought** that the registration process is biased towards civils and mechanicals – IEs have a hard time passing
It’s About Showing What You Can Do

- Career and resume discriminator
- What do hiring firms look for?
- Degrees, work references, technical skills
- What if there was a universal standard that was recognized throughout the profession?
- International recognition—foreign countries
Why Professional Engineering Licensure?

- Protects **public health, safety and welfare**
History of Engineering Licensure in the U.S.

• 1907 – Wyoming was the first state to enact engineering licensure laws
  – Charles Bellamy, Surveyor, First PE in USA

• 1928-- California– St. Francis Dam Break, March 12
  – Castaic, Northeastern Los Angeles County

• 1937– Texas, March 18, New London School Fire
  – New London, Rusk County, East Texas

• 1948– All states had some form of professional engineering licensure
Industrial Engineers—**Protect Public Health, Safety and Welfare**

• IE—Only discipline to explicitly include humans in **systems design**!
  – Human Factors/Ergonomics
  – Health Care
  – Financial Systems
  – Warehousing/Logistics
  – Manufacturing/Service Sectors
It’s Industrial *Engineering*

- Shouldn’t we want to be **professional** engineers?
- The PE is a key reason we are a recognized engineering discipline
  - Sets IEs apart from Math, Mgt, and Psych majors
  - *Differentiates* our graduates in the workplace and commands more salary in most cases (IEs with a PE license make more than math majors doing essentially the same job [NSPE 2013 Salary survey])
- Professional licensure is a “No Brainer!”
Professional Engineering License For Industrial Engineers

- Consulting
- Own an engineering firm
- Perform Government Work
- Be Identified as a Professional Engineer

- Cost/Benefit Analysis
State Role in Licensure

- Professional Engineering Licensure in the USA is Controlled by Each State
Note: The number of years of acceptable experience depends on the academic career and highest earned degree.
On Line Engineering Licensure Web sites

• Engineerintrainingexam.com

• Prepineer.com

• Engineerboards.com
Fundamentals of Engineering Examination

- The FE is focused by discipline; IE has their own test – covering IE material
- Computer Based Test completed at Pearson VUE testing center
- On demand, Schedule it, Take it
- 110 Questions
- 6 hour length
- Given throughout the year
- Fees
  - Paid to testing center
  - Paid to State, varies by state
## FE for IE Exam Content

<table>
<thead>
<tr>
<th>Topic</th>
<th># of Questions</th>
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<tbody>
<tr>
<td>Mathematics</td>
<td>6-9</td>
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<tr>
<td>Engineering Sciences</td>
<td>5-8</td>
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<tr>
<td>Ethics and Professional Practice</td>
<td>5-8</td>
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<tr>
<td>Engineering Economics</td>
<td>10-15</td>
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<tr>
<td>Probability and Statistics</td>
<td>10-15</td>
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<tr>
<td>Modeling and Computations</td>
<td>8-12</td>
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<tr>
<td>Industrial Management</td>
<td>8-12</td>
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<tr>
<td>Manufacturing, Production and Service Systems</td>
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<td>Facilities and Logistics</td>
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<td>Human Factors</td>
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<td>Work Design</td>
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<tr>
<td>Quality</td>
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<tr>
<td>Systems Engineering</td>
<td>8-12</td>
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Full specification published online at NCEES.org
Experience

- **Normally**, 4 years of practical experience required between award of FE and taking PE examination
- **Experience** requirement changes if you have a graduate, i.e., Masters or PhD Degree
  - State Dependent— all are different
- Recorded via the SER [Supplemental Experience Record]
Supplemental Experience Record (SER)

• Document each work assignment from day 1-

• Use Engineering Action VERBS
  – You designed, calculated, measured, engineered, built, constructed, modeled............

  – You DID NOT coordinate, attend, assist, aid, compile....................
PE Exam Process

• Take FE exam, receive certificate; or receive FE exam waiver
• Gain ~4 years of experience
  • Experience documented in record format
• Must have 3-5 licensed Engineers* verify experience
• Take PE exam; or receive PE exam waiver
• Some states make allowances for Engineering Educators, i.e., no testing to become a PE
• Industrial PE exam given in April each year
  – 80 questions, about 6 minutes per question
PE Exam Content

<table>
<thead>
<tr>
<th>Topic</th>
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<tbody>
<tr>
<td>Systems Analysis and Design</td>
<td>20%</td>
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<tr>
<td>Facilities Engineering and Design</td>
<td>20%</td>
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<tr>
<td>Supply Chain and Logistics</td>
<td>20%</td>
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<tr>
<td>Work Design</td>
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<td>Quality Engineering</td>
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Licensure vs. Certification

• What are the similarities and differences between licensure and certification?
  – Certification is generally voluntary
  – Licensure is a privilege granted by state and territorial legislatures
Bottom Line

• Engineering licensure is the hallmark of a true professional
• True Differentiator in the hiring process
• Signifies competence in field
• Recognized Internationally
• Normally, a higher salary is paid to a PE
Myths busted

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IIE PE License Review Course

– Contact IIE to schedule an on-line or in residence class (Feb. 9-12, 2015) to review the material for the Professional Engineering Licensing Examination given in April 2015.

– Register online at www.iienet2.org/iietrainingcenter or call IIE Customer Service at 770.449.0460 to enroll today.