Problem Structure Ideas:

- Seek problems that allow students to work with sub components of a system (e.g., analyze friction from a system power transmission situation where initially one of the issues is to analyze friction in the system and then go into successive steps).

- Help students learn how to use elements (e.g., statics) from the authentic problems and put them into a full project.

- Look for coupled problems to add more authenticity to the problem(s) (e.g., put two of these problems together - a structures and a fluids problem together where one affects the other).

- Helpful to find problems that help force students to use synthesis skills that would help weave component parts together.

- If you are looking for more routine problems you want to be cognizant of the stage or life cycle that the problem occurs in. For example in manufacturing, problems that occur during the R & D phase may not be as routine as those problems that employers may experience at a later stage of product life cycle or manufacturing process.

Authentic Problem Generation & Application Process:

- When speaking with employers during first contact and in-person meeting, ask "What are the problems you face on a regular basis? That is, what kind of challenges do you face (i.e., green economy, new standards, etc)?" (add this to step 2 of the process)

- Suggest sharing competencies (for selected target course) with employer representatives to spur problem ideation and identification. As practitioners, the employers should be able to identify activities/problems that utilize core concepts and competencies. (add to step 2 of the process)

- Develop a template to use with the employer to help build the authentic problems. (add to step 2 of the process)

- Recommend also stating to employers that we are looking primarily for better learning activities for students that might replace textbook activities currently being used. This may help employers appropriately "size" their authentic problem suggestions. (add to step 2 of the process)

- To help reinforce authenticity of the problem to the students invite employers to introduce the problem to the students. (add this to step 3 of the process)

Employers and/or Employer Groups to Consider:

- Ash Stevens

- Legend Valve

- American Association of Engineering Companies (ACEC)

- Michigan Infrastructure and Transportation Association (MITA)

- Michigan Concrete Association (MCA)

- Asphalt Paving Association (APAM)

- Many of the IT-related companies are grappling with systems engineering problems, as it relates to new things that are going on with the whole cloud computing movement thinking in terms of setting up systems and the utility type of approach. May be put the CPACE team in contact with some of those companies.