

*SIMONE:*

*As we saw previously, the earliest engineers were trained through apprenticeship - a method established in Britain, the heart of the industrial revolution. In Continental Europe, particularly France and Germany, a highly academic training regime was established. In the United States a model balancing academic study with practical experience became dominant.*

*But as the profession developed, so did the need for regulation and licensing.*

SIMONE (VOICE OVER):

By the beginning of the 20th century, new technologies and developments in urban planning created new engineering disciplines and demands for more specialized training: Electrification brought about the electrical engineer. Ever taller buildings placed new demands on structural engineers, while the need to heat and cool these new structures brought about new specializations.

These rapid changes prompted the United States to forge ahead and develop its own unique system for training engineers.

Along with the increased need for specialized training there was also a growing need to ensure engineers were actually qualified to do their work.

Professional associations had already attempted to set professional standards.

The first attempt was by the Institution of Civil Engineers, in Britain. The Royal Charter of 1828 charged the I.C.E to ensure that only those persons with proper training and experience were deemed qualified to carry out civil engineering projects.

The establishment of organizations like the ICE was part of a larger trend by professionals, such as lawyers, doctors and accountants, to form self-regulatory groups.

A further benefit of forming a professional organization was the social recognition it would offer. Engineers were quite conscious of this benefit, and they used military, legal and medical associations as their models.

In the United States, the individual states rather than professional associations are responsible for regulating professions, this includes licensing for engineers.

It was in the early 1900s, in Wyoming, that the shortcomings of self-regulation became apparent.

At that time, people applying to use the state's water for irrigation purposes had to provide a map of all water sources they planned to tap.

What Clarence Johnston, the state's engineer at the time, discovered was that many untrained individuals – lawyers, notaries and others – were performing the work of engineers and surveyors in preparing these applications.

The result was a mess. No accurate records for water use could be developed.

In 1907, Johnston successfully presented a bill to the state legislature, which would require any engineer or surveyor working in Wyoming to be licensed by a state board of examiners. Louisiana followed suit the next year with several other states falling into line soon after.

However, American engineering societies preferred self-regulation. They argued that only engineers should pass judgement on other engineers. But as public safety issues became more and more apparent, licensing became inevitable. Organizations such as the ASCE eventually and reluctantly supported licensing, so long as it was not too restrictive.

As more and more states required licensing another problem emerged – none of the state boards accepted out-of-state licenses.

In 1920, to remedy this situation, the Iowa State Board of Engineering Examiners called on the ten existing state boards to create a method for interstate registration. Seven of the boards responded, and the National Council of Examiners for Engineering and Surveying was created.

The NCEES established reciprocal relations between the member boards and worked to develop uniform licensing standards for them.

It also established record keeping procedures to assist engineers looking for work in different states.

However the journey to uniform nationwide standards took many years to achieve. Even in the 1950s engineers in different parts of the country wrote different competency exams. It was not until 1984 that all U.S. engineers wrote the same set of exams.

*SIMONE:*

*Since the end of the 19th century American engineers have tried to promote self-regulation. As circumstances changed – such as concern for public safety and third party needs for regulation – engineering societies have accepted the need for state licensing. However, the preference by these self-regulating societies has always been for self-regulation.*

*A consistent theme in American engineers' efforts to define themselves has been: professionalism and professionalization through licensing to protect the public from unscrupulous engineers.*