Vol. 9, No. 1 – 20 April 2009

SZÉKELY ENGINEERING

EXPLANATIONS & EXAMPLES

"It was Better When it Was Worse"

Those words were repeated to me by a very senior engineering colleague just before a group of us were to meet with NYC Department of Buildings officials in our ongoing effort help the Department make some sense of the Special Inspection process they recently implemented. He was quoting an engineer even older than he (neat trick), who had spoken of the old Department of Buildings where, although many were of low integrity, they were of high competence, as opposed to many of those currently employed by the Department, who are of high integrity but of low competence.

Of course, one can be a cynic, and say that's just what one should expect from those whom the Department believes they're regulating (more on the choice of words later), but one might not only be mistaken in that assessment, but very badly mistaken.

Let's review.

According to the Department's history (no longer on their website), it all started with the Dutch in the 1600's, and evolved into a 5-borough agency by 1936. In 1977 it was split into today's two separate agencies, the Department of Buildings (DOB), and the Department of Housing Preservation and Development (HPD).

While it's reasonable to infer the Dutch felt the need to implement building and zoning laws as a result of the distressingly common failures which have occurred since Egyptians starting piling stones on the banks of the Nile, it's a whole other thing to then take the leap that the legislators knew a single thing about how to prevent construction failures, and this is not very different from the situation which exists today.

Professions exist because of this very reason.

That is, that until the apprenticeship standards of guilds evolved into the educational and experience standards of professions, almost anyone could call themselves a qualified practitioner in a new field such as engineering. When some millwrights and wainwrights began calling themselves engineers, few members of the lay public had any idea what an engineer might be – not that much has changed since then with regard to the understanding of the lay public.

However, it was this wee problem of houses and bridges collapsing and burning, and later on, of boilers exploding, which caused the early New Yorkers such consternation.

Barbering started to become surgery in the 15th century, and building tradesmen and military siege-engine and bridge builders started to evolve into design professionals a century or two after that, but Architectural licensing began to become uniform in the U.S, in only 1919, with Engineering only following suit between 1934 and 1936.

With that prologue, please pay attention to what follows, for it's key to understanding what's going on here.

While guilds evolved to protect means of livelihood, as well as to instruct novices in those means, professions evolved from guilds almost as a means of self-preservation and protection, ***of*** the public as well as ***for*** the practitioner.

If a wainwright produced a shoddy wagon, and a wheel fell off at 10 mph or so, chances are those on board at the time would have survived with relatively minor injuries at worst. With automobiles, exploding gas tanks from rear-end collisions and pancaking of roofs during rollovers often resulted in fatalities, and while medical mistakes usually kill at the retail (one person at a time) level, collapsing buildings and bridges usually dispatch many unfortunates in one fell swoop.

Our mistakes can slay you wholesale.

Things were so bad in the early days of the design professions that when John A. Roebling started design work on the Brooklyn Bridge in 1867, bridge collapses were a such a common thing (witness the Broughton Suspension Bridge in 1831, Wheeling Suspension Bridge in 1854, and the [First] Queenston-Lewiston Bridge in 1854 or 1864) that design professionals, ***NOT*** government agencies, began to get together to address the problem. This led to the birth of the American Society of Civil Engineers (ASCE) in 1867, the American Institute of Mining Engineers (AIME) in 1871, the American Society of Mechanical Engineers (ASME) in 1880, and the American Institute of Electrical Engineers (now IEEE) in 1884.

While this was a start, it took the formation of the National Society for Professional Engineers (NSPE) in 1934 to turn engineering in the United States into the learned profession it already was in Europe.

One of the hallmarks of a profession is the set of canons or laws which guide its practitioners. For Physicians, the Hippocratic Oath guides them to do no harm. For Engineers, their Creed is to put the public welfare above ***all*** other considerations.

I've never seen a set of canons for civil servants (think DMV), and on that note, early on in the last issue of this publication, I pointed out the Department of Buildings issued Directive 14 in 1975 " . . . in response to a number of factors . . ."

The astute reader may recall, from the beginning of this piece, that just two years after this directive gave design professionals more powers and responsibilities with regard to the issuance of construction permits and inspection of completed work, HPD was split off from DOB as a separate agency.

This is the second key thing to pay attention to. Design Professionals did not lobby for Directive 14; it was thrust upon them by an overwhelmed City Administration faced with a corrupt Department of Buildings – a possible reason HPD was split off from DOB.

Now things are supposed to be improved by diluting those powers, with the added features of a *City* department attempting to regulate the practice of a profession licensed by the *State*, and to expand inspection powers to yet more persons (who have no canon requiring the public welfare be above all other considerations), and, oh, by the way, *this time* it's all going to be fine because the civil servants are honest and well motivated.

Well, maybe. . . If only certain licensed employees of the Department wouldn't view private practice members of their own professions as the enemy.

Speaking of Exploding Boilers . . .

In 1865, a little while after collapsing bridges began to command the attention of governments and engineers, the steamboat Sultana suffered a boiler explosion while on the Mississippi River near Memphis that killed about 1800 persons, and it is recorded as the largest maritime disaster in U.S. history. Since it happened not quite two weeks after President Lincoln was assassinated, it has become overshadowed to the point of virtual non-remembrance by that larger event in history.

And Now, for Something Completely Different . . .

Regular readers of this publication may recall the aviation kick I'd been on some time back, writing about the Gimli Glider, the Air Canada 767 which flew on for at least 70 miles after it lost both engines due to a fueling miscalculation; had the captain not had to guess what best glide speed was, he may have been able to fly for a total of about 100 miles or so. As it was, they were in the air for 17 minutes without any engine power.

I wrote that piece in response to the belief a lay person (an attorney actually, but to us pilots and engineers, a lay person in the art of aviation) expressed to me that modern aircraft would fall uncontrollably out of the sky should their engines fail.

This was brought to mind again by the recent "Miracle on the Hudson" of U.S. Airways flight 1549, but in the latter case, Captain Sullenberger had all of three minutes between the time of the bird strikes and the touchdown in the water to:

1. Stabilize the aircraft
2. Determine that a return to LaGuardia was unfeasible
3. Determine that a diversion to Teterboro was similarly unfeasible.
4. Determine that the only possible good outcome lay in a water landing.

Talk about perfect decision making. (Not to mention pretty damn good flying!)

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