

# Ashtabula River Railroad Disaster, 1876

More than a century ago, anyone could work as an engineer without proof of competency. On December 29, 1876, two locomotives hauling 11 railcars and carrying 159 passengers plunged into the Ashtabula River in deep snow when the bridge gave way beneath them. The wooden cars were set alight by their heating stoves. Ninety-two people perished and it was the worst rail accident in the U.S. in the 19th century. The coroner's report found that the bridge, designed by the railroad company president, had been improperly designed and inadequately inspected.



Photo: <http://www.catskillarchive.com/rrextra/wkasht.Html>

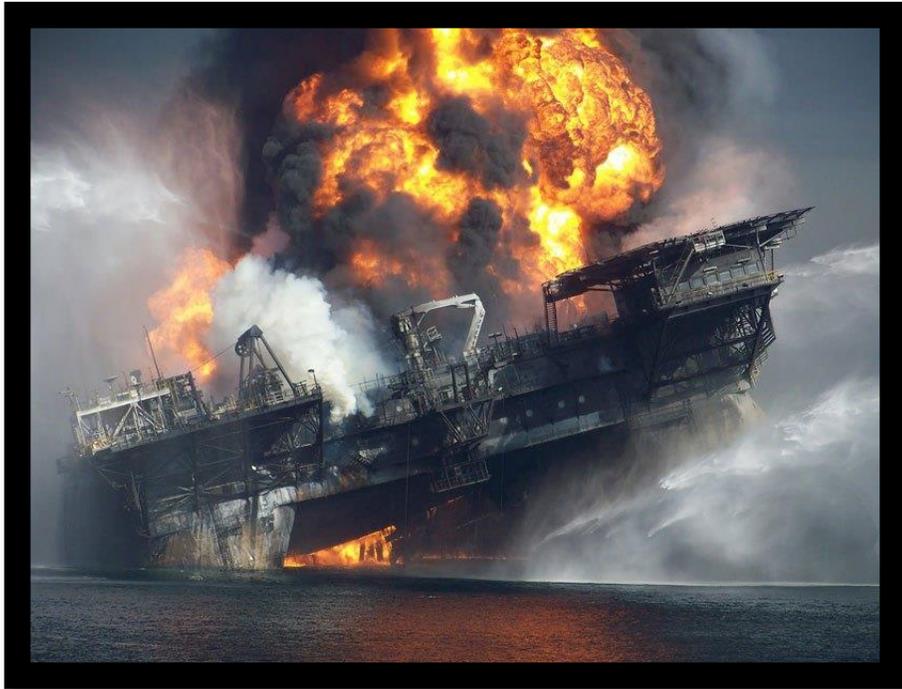
In order to protect the public health, safety, and welfare, the first engineering licensure law was enacted in 1907 in Wyoming. In 1933, an act regulating the practices of engineering and surveying was passed in Ohio. Today, every state regulates the practice of engineering to ensure public safety by granting only Professional Engineers (PEs) the authority to sign and seal engineering plans, and offer their services to the public.

# A short history of professional education & ethics codes

This disaster – **among many others** – demonstrated the need for:

- focused engineering education,
- implementation of professional engineering licensure and
- later codes of ethics for professional practice.

# Deepwater Horizon, 2010



On April 20, 2010, an explosion on the Deepwater Horizon oil rig killed the 11 men pictured here, and injured an additional seventeen. The investigation found significant safety lapses in the design and testing of the components that failed.

The findings led the Bureau of Safety and Environmental Enforcement to issue rules requiring licensed professional engineers to be involved in the design, and to certify the safety of well casings and cementing, and to certify well abandonment designs and procedures.



Jason C. Anderson, 35



Aaron Burkeen, 37



Donald Clark, 49



Stephen Ray Curtis, 39



Gordon Lewis Jones, 28



Roy Wyatt Kemp, 27



Karl Kleppinger, Jr, 38



Dewey A. Revette, 48



Shane M. Roshto, 22



Keith Blair Manuel, 56



Adam Weise, 24

# Gold King Mine, 2015

**On August 5, 2015, unlicensed contractors working for the U. S. Environmental Protection Agency triggered a leak that resulted in over 3 million gallons of mine waste water being leaked into the Animus and San Juan rivers. The waste water was full of contaminants like arsenic and lead.**

**Four years later, economic damage is still occurring. According to an article in the Albuquerque Journal, farmers have seen sales drop 25% “...because people say they won’t buy food grown” in the region.**  
(<https://www.abqjournal.com/1349543/gold-king-mine-spill-still-hurting-nm-4-years-later.html> )



Animus River, before and after over 3 million gallons of mine wastewater leaked into the river.



# Virgil C. Summer Nuclear Generating Station, Fairfield County, South Carolina

2007-2008: Two SC utilities plan to add two new nuclear reactor generators to the Virgil C. Summer facility for **\$10B**, which would go online in **2016**.

2007-2016: Cost **\$14B**. Delays mean it would go online in **2020**.

March 2017:

- Westinghouse Electric Company (WEC) files for bankruptcy.
- **Utilities investigate WEC's conduct.**

July 31, 2017:

- **Project is SHUT DOWN.**
- Estimated total cost **\$25B**. Being paid off by SC electrical customers.
- Westinghouse legal counsel recommended **NOT** using PEs.
- Construction plans were **NOT** prepared or reviewed by PEs as required by SC law.
- Drawings received from WEC were frequently **NOT** constructible.

September 26, 2017: SC's state law enforcement began an investigation because of unlicensed engineering in violation of state law.



***What a mess!***

# Virgil C. Summer Nuclear Generating Station, Fairfield County, South Carolina

## References:

**“Stamped for Failure: Westinghouse and SCANA Used Unlicensed Workers to Design Abandoned S.C. Nuclear Reactors,”** Post and Courier, Charleston, South Carolina

[http://www.postandcourier.com/business/stamped-for-failure-westinghouse-and-scana-used-unlicensed-workers-to/article\\_3ea2046a-9d39-11e7-a186-cb396c86b8b9.html?utm\\_medium=social&utm\\_source=facebook&utm\\_campaign=user-share](http://www.postandcourier.com/business/stamped-for-failure-westinghouse-and-scana-used-unlicensed-workers-to/article_3ea2046a-9d39-11e7-a186-cb396c86b8b9.html?utm_medium=social&utm_source=facebook&utm_campaign=user-share)

**“Why S.C. Residents Are Paying Billions for a Project That Doesn't Exist,”** Post and Courier, Charleston, SC [http://www.postandcourier.com/business/why-s-c-residents-are-paying-billions-for-a-project/article\\_0e5ae6cc-a875-11e7-acd0-17dbbef0c9e4.html](http://www.postandcourier.com/business/why-s-c-residents-are-paying-billions-for-a-project/article_0e5ae6cc-a875-11e7-acd0-17dbbef0c9e4.html)

**“NSPE Urges NRC to Investigate Failed Nuclear Project,”** National Society of Professional Engineers

<https://www.nspe.org/resources/issues-and-advocacy/latest-news/nspe-urges-nrc-investigate-failed-nuclear-project-south>



# Ohio State Fair, 2017

On the opening day of the Ohio State Fair in July, 2017, fun and frivolity turned to tragedy when the “Fireball” ride broke apart mid-operation.

Eighteen-year-old Marine recruit Tyler Jarrell lost his life that day. A second victim, Jennifer Lambert, 19, of Columbus, later died of liver failure after suffering a traumatic brain injury in the incident. Six others were also injured in the incident, blamed on excessive corrosion in a steel support beam.



In November 2019, Ohio Governor Mike DeWine signed “Tyler’s Law.” House Bill 189 makes a number of changes for amusement ride safety, such as defining qualifications for ride inspectors and outlining the responsibilities of ride owners.

Ohio Department of Agriculture Director Dorothy Pelanda was sure to tell reporters at the bill signing:

“It also requires that a professional engineer be a part of the ride advisory board going forward.”

# Merrimack Valley, Massachusetts, 2018

On September 13, 2018, mistakes made by unlicensed engineers doing gas pipeline replacement work led to over-pressurization of the pipeline, resulting in multiple explosions in the Massachusetts cities of Lawrence, Andover and North Andover.

Thousands of people were displaced, and one—an 18-year-old named Leonel Rondon, was killed.

As a result of its investigation, the NTSB recommended *ending engineering license exemptions* for gas pipeline utilities.

