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Unique Problems in the Tank and Thin Shell Structure World

By

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ABSTRACT

While obtaining technical training in Civil and Structural Engineering, students work through a large array of structural problems. After obtaining a BSAAE at Purdue I immediately began studies in Civil Engineering which I completed at Oklahoma State University obtaining a Master of Science Degree in Civil Engineering. Like most students I worked my way through several classes starting with basic statics and working up to energy methods, advanced steel design and computer methods of structural analysis. Upon entering the workforce I was promptly assigned a simple problem I had no idea how to solve. I quickly learned my time at Purdue was not the end of the educational portion of my engineering career. My career path led me to the tank and steel plate structures market. While many civil engineering courses provide training for analysis methods and design codes used in traditional structural markets, few studies focus specifically on storage tanks or thin shell structures. These structures are unique and industry design standards may not fully address all problems presented to the engineer. The recent revival of domestic energy in the U.S. has led to an increased demand for many of these structures. In this presentation I will review some common storage tanks and thin shell structures used in the industries we serve. I will review some unique design, analysis and construction challenges engineers in this industry must address and will provide examples of very unique construction methods that can be used on thin shell structures. I will show an example of how quickly these structures can collapse either during construction or if operating conditions fall outside of design parameters. When driving past your average municipal water tanks or oil storage tanks few are intrigued by the complexities that such structures may contain. In this presentation I hope to show that thin shell structures are not as simple as they appear. These structures can be very simple and straight forward but they also can provide some of the most challenging structural and construction problems in industry.

BIO: Ken Erdmann holds a Bachelor of Science in Aeronautical and Astronautical Engineering from Purdue University (1990) and a Master's Degree in Civil Engineering from Oklahoma State University (1998). While at Purdue Ken was a varsity letterman in Men's Swimming and a member of Sigma Phi Epsilon Fraternity. After obtaining a BSAAE degree and private pilot's license from Purdue, Ken turned his focus on Civil Engineering with interests in structural engineering and steel plate structures.