



Fred Deans and his son, Jeffrey

An Engineer's Life...

by Frederick S. Deans, P.E.

If you had told me when this all started that I would have an Engineer's Life, I would have given you a puzzled look and asked you what you were talking about. That would have been in 1964, when I was a junior in Bethel Park High School, Bethel Park, Pa. In fact, the aptitude tests given by our high school guidance councilor led me to believe that I was either going to run a hardware or an art-supply store. (I still get a warm feeling when I enter Greene's Art Supply Store in downtown Rochester, Michigan) Well, how did this engineering makeover happen?

Several transformational influences happened to me. First, my high school had an excellent college prep program that had a strong math, science, and humanities curricula. Taking that program put me on a path toward college. Second, to earn some spending money, I did odd jobs around our neighborhood for several families – I mowed lawns, raked leaves, shoveled snow, these are the kinds of all-year around jobs you could do in the Pittsburgh area. Most of the client family fathers were professional people, that is to say, they were engineers. They began to ask me what I was going to do with my life and why wouldn't I pursue an engineering degree? And, of course, I met Linda, who graduated a year ahead of me and for the last 50 years has been the steadying influence in my life (and Jeffrey's mother – more on this later.)

Phillip Ross, one of my lawn, leaf, & snow clients, was at the time the plant manager of Westinghouse Bettis Atomic Energy plant in Westmoreland, Pennsylvania. One day, Mr. Ross asked me what I was going to major in when I went to college. I told him I didn't know. He then said that if I got a Mechanical Engineering degree, he would hire me when I graduated from college. Well, that made up my mind. It was off to an M.E. degree for me.

In 1969, I selected Valparaiso University in Valparaiso, Indiana, which had had a small (200-student) Civil, Electrical, & Mechanical Engineering school. Valpo also offered me a scholarship, job, loan, and grant that paid the whopping \$2,200 USD/year room, board, and tuition costs. (You can't believe the costs now!) Valpo had some very unique educational advantages – class sizes were small and taught by full professors (no grad student assistants), each professor (all males) came from an industry background and regularly shared his non-academic experiences with us, and all the engineering students learned to support each other. Academic competition was important, but learning to work and help each other was more important.

After four years, with my BSME degree in hand plus a marriage to Linda, who graduated a year ahead of me with a degree in Chemistry, I headed back to the Pittsburgh area for that promised job at Westinghouse. I arrived for an interview at Bettis and told the human resources interviewer that Mr. Ross was my recommended contact. I was then told that Mr. Ross no longer worked at Bettis (oops!). But then I learned he had recently been promoted to vice-president and general manager of the division. The interviewer left the room, came back after 10 minutes, and said he had called



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Mr. Ross at his central office location. He was told to offer me a beginning engineer's position and he then asked me when could I start. All right!

Then something strange happened. I began to ask questions about the positions. They all required that I pursue a Ph.D. in Engineering. I wanted to use my new found "engineering expertise" right away, so going for a Ph.D. wasn't in my plans. I thanked Westinghouse and Mr. Ross and pursued other opportunities. I ended up accepting a production engineer's position at PPG Industries Works 1, Automotive Windshield plant, just north of Pittsburgh. My responsibilities included "cold end" processing (where flat glass was cut and edged) and the Plastic Department, where the polyvinylbuterate (PVB) laminate interlayer materials were processed. Interesting material this PVB: it had remarkable impact behavior. Here was my first experience with plastics, but certainly not my last.

After four years at Works 1, I was asked to move to PPG's General Office to become a Glass Division technical service engineer. This was a neat job. I got to work on every major architectural project in North America at the time: from Peachtree Plaza in Atlanta to the Renaissance Center in Detroit, to CN Tower in Toronto to Sears Tower in Chicago to Bonaventure Plaza in Los Angeles. There's a lot of engineering involved in window curtain-wall programs – heat transfer, wind and thermal load analyses, hail-stone impact, and building code and safety glazing compliance to start with. We introduced the industry's first computer-aided software for window glass selection for major building projects. I also got involved in PPG's Solar Collector program. PPG's solar collectors were insulating glass windows with a water heat exchanger attached to them. That entailed lots of winter trips to PPG customers in Florida, Southern California, and Hawaii. (What a great job!) And this is where I learned that in business, if you are technically correct but commercially wrong, you're still wrong.

In 1979, some manager at PPG thought I needed some sales experience, so, off I went to Detroit to become an OEM Glass sales representative. I was given the GM Chevy Truck & Bus account, a small portion of PPG's GM OEM business. There wasn't much engineering here. Once a year, I quoted PPG's next year's auto-glass

prices. We lost business or we gained business. Fortunately for me, we gained more than we lost. My job was more about glad-handling purchasing people than solving problems. I felt something was missing in my job. You guessed it, where did the engineering go?

In 1985, I met Sheppard Sikes, general manager of PPG Fiberglass and AZDEL Products. One day he stopped by my office and told me that I was wasting my life away as a sales guy and that I should consider becoming an AZDEL application development engineer. Alright, I'm back in the engineering realm. By the way, what are FEA, shear-edged compression mold, CRASH and NVH analyses, and long-fiber thermoplastic composites? All these I would learn in my experiences in the wonderful engineering world of composites. The PPG AZDEL experience lasted one year. In 1986 two important changes happened. First, GE Plastics (GEP) bought half of the AZDEL business, so off I went to GEP and a joint venture of equals – yeah, sort of like DaimlerChrysler. And second, our son Jeffrey came along. (What do 39-year old, first-time parents know about parenting? It truly has become my life-long engineering assignment.)

Going from PPG to GEP was like going from a merry-go-round to a roller coaster. The rides both take the same length of time, but there were a lot more topsy-turvy dizzy spells with GEP. My assignment at the new joint venture was to handle glass-mat thermoplastic (GMT) bumper development. Here, the composite gods smiled on me. This time, it was in the form of the *Honda Accord* uni-directional bumper program. In the mid-1980s, the Insurance Institute for Highway Safety (IIHS) bumper impact test rated the *Accord's* steel bumper impact as very poor (i.e. expensive to repair even after a mere 5 mi/hr (8 km/hr) impact). The engineers at Honda came up with a very unique bumper design that eliminated the shock-absorber attachments and introduced a simple "pin"-type, "0-bending moment" attachment system. (The beam had to absorb a significant amount of impact energy.) What was needed was a molded composite bumper beam. Honda selected AZDEL's unidirectional GMT material, which was a new material at the time. As the program manager, It was my job to not only come up with the best composite material, but to convince Honda and AZDEL management that we had the best process, quality control, and suppliers who could support a global program. After a short 18-month development and testing program, the



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Accord composite bumper beam was launched. It was a single 12-million lb/5.4-million kg application program. And within three years, every other Japanese OEM had an AZDEL bumper beam. Let's hear it for GMT!

Well, it seems that no one lasts forever at GEP, not even GEP itself. In 1992, I began a 16-year job odyssey that finally ended with me retiring from Hanwha AZDEL, which had bought the business from SABIC - PPG, which had acquired GE's Plastics business in 2007. In 2008, my life-long friends, Tom Russell and Al Murray and I became business partners in a startup venture called Allied Composite Technologies. ACT, as we call it, does consulting and technical/business management support for a variety of clients. We specialize in developing new materials and applications in the transportation, building & construction, and infrastructure markets. And I'm happy to note that there's lots of engineering there.

So how does an Engineer's Life fit in my last 45 years? I believe engineering is just as much an attitude as it is a process. It gives one the character to stand up to challenges — be they on the job or personal — and face life with an "I can solve this" approach. Engineering is basically a process that breaks down large, complex problems (otherwise known as opportunities) into smaller, easier to solve, less complex problems. Engineering gives you the tools and the aptitude to tackle complex problems with a take-no-prisoners attitude. Engineers have a bit of a swagger when it comes to approaching every-day challenges...not that I think we're better than anyone else. In fact, I am a very-low ego and humble engineering guy.

Now, here's where engineering and Jeffrey, my son come together. From a very young age, I would expose engineering as a way of life to the "Boy." I also had other adults tell him that engineering was a neat deal. Low and behold, when he graduated from high school, he told Linda and I that he wanted to enroll in Michigan State University's

Engineering program. Four years later, he graduated and accepted a job as a process engineer at Ford Motor Co. And now days he's a senior process engineer at Unilever's Hammond, Indiana plant. Of course, I give his mother most of the credit in his upbringing. My contribution? Let's call it an Engineer's Life.

ABOUT FRED DEANS

Frederick Deans is currently the chief-marketing officer and a principal of Allied Composites Technologies, LLC (ACT) as well as the owner of F. Deans & Associates, a Michigan-based enterprise. Deans also is a long-time member of the board of directors of both the Automotive and Composites Divisions of the Society of Plastics Engineers International. He is past-chair of the SPE Automotive Composites Conference & Exhibition (ACCE) from years 2001 and 2004. Deans also has been given the SPE Honored Service Member award in 2003 and the SPE Composites Person of the Year in 2006. He is a licensed professional engineer in the Commonwealth of Pennsylvania. Deans holds a BSME degree from Valparaiso University and an MBA degree in Business Administration from the University of Pittsburgh. Throughout his career, he has had responsibilities as a production engineer, technical service engineer, sales manager, market & industry manager, and director of new business development covering the automotive, industrial, materials handling, and building & construction sectors.