I grew up in small town on the Gulf Coast of Texas, and it was the bedroom community for a big Dow Chemical plant. Although the population was only about 7,000, it was rich in an important asset—engineers. As a kid, it seemed to me that half of all the adult males who lived there were engineers—mostly chemical, but a lot of mechanical and electrical engineers as well. Not knowing any better, I assumed that all towns were like that, and the type and manner of thinking that engineers do was, well, normal.

I also thought that I knew what happened to engineers right out of school when they came to work at Dow for their first job. They show up on the appointed day, dressed in a jacket and tie, and armed with an expectant, but perhaps slightly uncertain, smile. They would be immediately counseled to get rid of the jacket and tie (“It’s too darned hot here in Texas for that!”) and then sent out into the plant with someone slightly more experienced to learn their way around and “get their hands dirty.” The new hire would be assigned to one of the products (vinyl chloride, say) and spend a couple of years learning absolutely everything about it and the plant that produced it. Without realizing it, they would become the local expert and, a bit to their surprise, within a few years find themselves leading even younger engineers and then moving into management and leadership roles. So, when I went off to college to get an electrical engineering degree, I thought I would have a similar experience when (and if) I graduated, and I was looking forward to it.

In fact, it didn’t work that way at all. My first post-college job wasn’t with a company, but with the U.S. Navy. How did this happen, you might ask? I would love to tell you that military service was a long family tradition or that I signed up in a flash of patriotic fervor. In fact, a key consideration was that the Navy Reserve Officers’ Training Corps program was willing to provide financial support for my college education. In trade for this support, I would take extra classes in college (for example, celestial navigation), spend three summers out in the fleet, and then put in four years of active duty on a ship. I was quite conflicted by the choice I’d made. While very practical in terms of paying for a chunk of my undergraduate education, spending four years in the Navy hadn’t been a part of the plan for my life. What I really wanted to do was be an engineer—to go design and build things—to bend technology to the needs of humanity. I thought at the time that the Navy and engineering had nothing in common. I was wrong, and it turned out that my engineering education couldn’t have been a better way to prepare me for the Navy (and, later, vice versa).

I entered the Navy as the lowest of officers—an ensign—and was assigned to a ship older than I was as what’s called a division officer. As a division officer, I had three almost-orthogonal sets of responsibilities. While underway (which seemed to me to be constantly), I stood watches on the bridge four of every 16 h, rotating day in and day out. I also had a full-time administrative duty—the first one being the responsibility for the repair of most of the ship’s electronic gear. On top of all that, I was the leader of a division of ten enlisted men. Thus, I had operational, administrative, and leadership duties all at the young age of 22. By the time I left the Navy four years later, I had qualified as a fleet officer of the deck, moved up two steps...
in rank, deployed overseas four times, commissioned a
new ship, taken my ships through four shipyards, and
ended up leading 75 officers and enlisted men. All this
before I was 27 years old. I wasn't unique, of course. This
is what the Navy expects of its junior officers.

Preparation and process
What did my engineering education do to prepare me for
this? As a review, let’s think about the engineering pro­
cess—clearly stating the problem to be solved, analyzing
the problem and the degrees of freedom available to solve
it, designing a solution, implementing the solution, testing
the result, training all involved to use the solution, and—
all along the way—communicating with everyone involved
about the plan to reach the desired outcome. (And if
money and schedule are important, doing the job within
those constraints.) Of course, when I was an undergradu­
ate student at Rice University, I thought in terms of solv­
ing problems with transistors and z-transforms. What I
didn’t realize until about halfway through my time in the
Navy was that I was using the engineering design process
all the time—but I was using it to solve problems related
to personnel, equipment management and maintenance,
and even real-time ship maneuvering. The process that
engineers learn about in engineering school seemed to be
almost universally useful. It certainly was in the Navy,
and my experience since age 27 continues to prove that.
Engineers are trained problem solvers. Sometimes the
tools needed to solve the problem at hand are semiconduc­
tors and software, but the methods work on a far larger
management and leadership scale as well.

This isn’t intended to be an advertisement for the
U.S. Navy nor any of the armed services. My story is
an example that a good engineering education, and the
thought processes that engineers are taught to use,
turn out to be valuable for many jobs. It is little wonder
to me that engineers are so successful, on average, in
fields that don’t, at first blush, seem to need engineering
skills—medicine, law, business, and even government
leadership come to mind. It’s just the same as the Navy.
Engineers are problem solvers, and the world needs
those skills in many places.

Words of wisdom
I would like to provide you with a few pieces of advice
that I learned from my time in the Navy. I hope these are
useful to you if it turns out that your first job, like mine,
 isn’t exactly what you expected it to be.

■ You don’t have to like what you are doing to do a
good job. No job is purely fun, and some are very lit­
tle fun (riding out storms in the Aegean comes to
mind), but your execution of your job to your person­
al high standard is important. You will notice, even if
no one else does.

■ You don’t have to like your boss. My first boss (my first
captain) seemed to be aloof and unfriendly. In retro­
spect, he had a powerful positive force on my life. He
was thoroughly competent, which made him brave
enough to let 23-year-olds like me drive his ship. In
the process, he gave me the confidence to take on even
bigger challenges in my future life.

■ Even if your boss doesn’t like you when you first meet,
your good work and loyalty to the common objective
can turn him or her around, and, in fact, make him/her a lifelong friend.

Conversely, did my first job teach me things that helped
me in the engineering career that followed my tour in the
Navy? You bet. While another column could be written
about each one, I’ll list just a few.

■ Virtually no engineering problem can be solved by one
person alone. As a result, engineering is a team sport.
Teams need leadership, and you definitely learn
about leadership (many good examples but some bad)
in the Navy.

■ Engineering solutions are rarely operated in the field
by engineers. As an “operator” in the Navy, I learned
that engineering solutions must be designed to be
used by sailors—and that sailors, on average, don’t
know calculus, nor do they love buttons, knobs, and
lights added seemingly for their own sake. Equipment
built for engineers by engineers is almost always use­
less in operational practice.

■ The ability to communicate upward, downward, and
 to your peers, in writing and verbally, tersely and in
detail, is crucial to professional success. It was true in
the Navy and is equally true outside of the service.
The good news is that the Navy taught me the value of
it. At this point in my career, I spend approximately
98% of my time communicating. You have to learn
somewhere how to do this. If you haven’t already, you
should start.
The Navy taught me how to operate in high-stress environments. Almost getting run over by an aircraft carrier isn’t the same as recognizing that your project is getting completely out of financial control, but the skill to remain calm, quickly analyze the situation, and then act constructively to solve the problem is needed in both situations (albeit a little quicker in the case of the aircraft carrier).

I should add that I have had several “first jobs” since my time in the Navy. Not first chronologically, perhaps, but first in the sense that they were different enough that they forced me out of my comfort zone and into learning new things. While waiting for my wife to finish graduate school, I took what I thought would be a one-year temporary job with a small company in Palo Alto, California. They wouldn’t tell me what they did or who they did it for. My mentor merely said, “Trust me. You’ll love it.” I did, and that temporary job effectively sent me down the career path that I’m still on. I worked at that first job for six years and then went to a very different first job, teaching electrical engineering at Cornell University. From there, it was off to a startup in Silicon Valley, which is where I remain even after 34 years.

My newest first job is as the president of the IEEE Foundation, the IEEE’s partner in performing philanthropic work in the world—as the IEEE logo says, applying “technology for the benefit of humanity.” This job is also forcing me to learn about new things, meet new people, and solve yet a new set of problems.

A final thought: Life is all about solving problems, and engineers are trained to do exactly that. In fact, I claim that they do it better than almost everyone else. So, take that thought into your first job and use those skills. They will serve you well over your whole career—whether that career is in engineering, in another field, or even the U.S. Navy.

About the author

John Treichler (John.R.Treichler@raytheon.com) earned his undergraduate degrees from Rice University in 1970 and his Ph.D. degree in electrical engineering from Stanford University in 1977. He served as a line officer aboard destroyers in the U.S. Navy from 1970 to 1974. Since 1977, he has worked for ARGO Systems, taught at Stanford and Cornell University, and helped found Applied Signal Technology, Inc. in 1984 as its chief technical officer. He joined the IEEE in 1970 and is a Life Fellow. He is a member of the National Academy of Engineering and is currently the president of the IEEE Foundation, the IEEE’s philanthropic partner in investment in the IEEE’s mission.