



Sloan Career Cornerstone Center

Profiles of Mechanical Engineers



William "Bill" Line, P.E.

**Vice-President
Design & Building Division
Syska & Hennessy
Los Angeles, CA**

Education:

BS, Mechanical Engineering, Rensselaer Polytechnic Institute
BS, Building Science, Rensselaer Polytechnic Institute

Job Description:

Vice President, developing and managing design, building, maintenance, and facilities improvement projects.

Advice to Students:

"Look at a lot of different alternatives in a lot of different industries to really try to take the time to understand them."

Comments:

Bill decided early that he wanted to work on the engineering side of the construction industry. He enjoys being able to carry a project from basic design through to a finished building. Along the way he solves problems that may be mechanical, electrical, architectural, financial, or political and regulatory in nature.

Video Transcript 1:

"Basically, it's price of admission. You know, at a certain level, you just don't get there if you're not licensed. And it's important -- you can be just as talented an engineer possibly without a license, but it's the validation that you need to really enter at certain levels of certain types of projects."

Interview:

Q: Say your name and who you work for, and just some of your background.

Line: OK, my name's Bill Line. I work for Syska & Hennessy, which is a mechanical, electrical, plumbing, fire-protection engineering firm. I manage a design/build division in a subsidiary of Syska & Hennessy Construction Engineering Management, which is a subsidiary specializing in design/build of technically focused projects that are basically targeted at the mechanical/electrical building systems that are a spin-off of the core business.

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Q: What are some of the projects you work on?

Line: We're doing projects under a contract with the Corps of Engineers at Air Force bases and Army bases around the country. Mostly in medical facilities, systems-repair and replacement projects. And chiller retrofits and generator replacements, things like that. We're also doing a couple of systems-replacement projects for private clients here in town. Technically oriented clients; like banks, financial services institutions. We're replacing mechanical systems, upgrading emergency power systems, things like that. And in those projects, we're doing really full "turn-key" design and construction. We have turn-key design and construction responsibility. We have no laborers or anything as employees. We contract out -- bid and contract with subcontractors for that work. So this is a new venture for Syska & Hennessy. Syska's done M&E engineering for 70 years. And now, you know, we're branching out really into a new arena for us.

Q: Is this a large company?

Line: Syska's got about 450 employees in offices around the country. A couple of hundred in New York, a small office in Washington that's probably about a dozen people. Twenty people in Cambridge, 35 in Princeton. This office is about 100 in Los Angeles. And a handful of people in San Francisco. And my division has some people in Texas and Chicago that are mainly project offices in those locations.

Q: Just in one simple sentence, what is it that you do?

Line: We do a lot of different things. And basically, what we've come to be focused on in recent years is maybe less-so on delivering a set of drawings and specifications that describe building systems, and more-so on trying to solve building owners' or facility owners' problems by applying the technology that we're trained and are expert in. And, finding ways to either solve their building problems or even their business problems through applying mechanical/electrical technologies.

Q: What does Bill Line do?

Line: Talk on the phone, write reports, things like that. Develop budgets, schedules. And basically figure out all the parts and pieces that go into a project in order to take it from inception to completion. An owner might just know that, "I've got systems that are important to me and I don't want them to go down. Costs me a lot of money." So you could put in generators, give them UPS systems. There's a lot of available technologies that we then try to select from and optimize for a particular owner, based on what they can spend, what they like to accomplish. What their short and long-term business goals are, and try to package a solution that's best for that owner. You know, you study six different buildings, six different ways, and you could end up with six different system designs for what could have apparently been the same project going in. And many of our clients don't know what they want. They know the result that they want, but they don't know what it takes to get from here to there. And we spend a lot of time trying to figure out what they want, why they want it. Learn a little more about their business, what's important, and come up with an optimal solution for them.

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Q: How long does it take to figure it all out ?

Line: It really depends on the project. And in cases where we try to provide integrated solutions, there isn't always a mechanical solution to a building owner's problem. Sometimes it's electrical, sometimes it could be anything. And ideally what comes out is that we're smart enough to see what application is best and figure out what it is. It may not be a mechanical/electrical solution. We've spent a lot of time trying to elevate ourselves as a service provider specializing in mechanical and electrical engineering. And, through being a service provider, maybe elevate ourselves to a level beyond just, "I design mechanical air conditioning systems. Or I design electrical systems for buildings." We basically sit at the table with the strategic planners of the project and decide what's best for a business or what's best for an owner.

Q: How does that affect you personally -- a solution that's not necessarily a mechanical solution?

Line: Bottom line, I guess, short term, you could say that sometimes it costs you money. If you develop a solution that's less expensive than another, you may earn less fee dollars or earn fewer construction dollars. But basically if you see yourself as a service provider, what you're trying to do is what's best for an owner or best for a client. We found out quickly in this office that it pays back tenfold. It's a "bread upon the water" kind of approach, where if you do something right and do it great, you get to do it all the time. We have owners that won't talk to other engineers. We are their engineers for everything. They may be willing to pay a premium -- I mean, not a huge premium -- for a commodities service, depending on what we're doing. But we find ourselves involved in providing services that maybe aren't priceable, or don't fit the normal-rate schedules, or that nobody else in the market sells. So you know, you make out a lot better in the long run.

Q: How do you come up with your solutions?

Line: It clearly requires a broader approach to problem solving than maybe you've got out of your core engineering curriculum -- maybe, you know, a "Renaissance" approach to looking at a problem for an owner. And it requires development of a lot of skills that are beyond technical problem solving and engineering that you get out of engineering school. When we interview people, we have a really heavy focus at all levels that we hire on communication skills. People are going to talk to clients, they're going to talk to people within the office. And, you can be the most brilliant person and if you can't tell somebody about it, it almost doesn't count. And communication skills are as important as technical skills. And that really is what elevates you to the next level, is being able to, you know, develop a rapport with an owner, understand what they want, and then turn around and help them understand what it is you're doing for them.

Q: So how did you get to this point? You know, just go back to the beginning. Let's do a quick career path: "I was born in a log cabin."

Line: Yeah, walked uphill to school everyday. I went to school at Rensselaer Polytechnic Institute in upstate New York. I started out in the architecture program and sort of became a little frustrated. I found myself a more practical person than maybe the architecture program wanted. And, you know, I was trying to find ways to do things that were buildable, as opposed

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to maybe let my mind go wild and come up with something that's a little "off the wall." So after two years, I added a "mechanical" major as well, and ended up with a Bachelor's in building science out of the School of Architecture and a Bachelor's degree in BSME out of the School of Engineering. And I wanted to be in the construction industry because I thought it was sort of neat to be able to have a large contribution in building a building. You know, the alternative paths just didn't interest me as much -- maybe doing finite-element stress analysis on piping at a power plant and be able to say, "Oh yeah, I designed that flange" -- as opposed to being able to point to a building. I mean, the delivery cycle's faster. Buildings go up in a year and a half, two years or something -- and being able to point to a building and feel like you had a big part in making it happen and making it what it is. So I gravitated to the engineering side of the construction industry. And started with Syska & Hennessy out of school. Worked in New York for four years. Moved to California in 1986. Worked here for seven years. Transferred to Chicago with my wife's work and went to work for an A&E firm that also did a lot of design/build work in Chicago for about a year and a half. When her company went out of business, we found ourselves coming back to Los Angeles. And then Syska formed a design/build subsidiary, which is where I'm at now.

Q: So, obviously a dual-career kind of lifestyle.

Line: My wife's career and mine have always been equally important. And you know, for all the logical reasons. She made as good money as I've ever made and had just as much of a future. She went to work as a corporate treasurer with an investment firm in New York. Worked for an insurance company out here as you know, in the corporate treasury department. And we just always figured that we'd have a pretty strong focus on career. And, you know, commuted to work every day, both in New York and here.

Q: Do you see any similarities or difference in your approach to problem solving?

Line: It's probably the most -- in hindsight, which is clear as a bell -- is I felt like what I came out of engineering school with -- the best thing I came out of engineering school with was the ability to solve problems. It was a problem solving mentality. You'd go through your classes focused on understanding things like Bernoulli's equation and lumped-parameter systems and things like that. And you realize after that the best thing you learned was how to apply a methodical approach to solving a problem -- identifying what do I know, what don't I know, what do I want to know, what neighborhood does the answer live in and how do I get from here to there. And it's something that I've found applicable to really any type of problem. A financial problem, taxes, business problem in any field. And I really found that when my wife was taking her classes in her MBA in New York, she'd have groups into our apartment working on a project. And they'd ask me, "Gee, do you understand this stuff?" Did you ever have anything like this? And I'd be able to look at it and say, "Well, you know that, you don't know that, what if you did this and set up this sort of relationship algebraically and, you know, that should work." And it's just an approach that applies to anything. I've realized after the fact that, that was what they were trying to teach me, as opposed to a lot of difficult and complicated models for things.

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Q: What types of people doing what sorts of jobs do you work with?

Line: We work with a very broad range of people, really from the top to the bottom. "Bottom" not in the derogatory sense, but really the full gamut of the corporate spectrum. We'll work for the decision makers that are deciding what projects to fund, what projects not to fund, how to prioritize a corporation's expenditures on their facilities in the next 10 years. At the same time, we're working closely with the men or women that own and operate the building on a day-to-day basis and maintain the building. So in designing our systems, we end up with something that's serviceable, something that's efficient to maintain. We don't just use a creative new light fixture if it requires the maintenance people to stock 30 different type of bulbs that they don't stock today. We run the whole range of people from the owner's side -- managing projects. People from contractors, people from project-management firms hired by the owners. And it's interesting, because every person requires a different approach to how you present information to them. And it's almost an "art" of being able to package what we need to communicate in a way that's tailored to the audience. Leasing people have a completely different focus on what's important in a project than building-maintenance engineers. And if we're trying to communicate the advantages or disadvantages of systems to a leasing agent versus a maintenance engineer versus the person paying for the development, it's a whole different approach. They need different things; they are interested in understanding different things. And we need to package our information in a way that's meaningful to whomever the audience is we're communicating with. That's something that we've recognized as very important and tried to train our people to do. So that you can walk around the other side of the table, sit down and say, "OK, what am I interested in if I'm that person?" And you can communicate the advantages and disadvantages of something or why this is the best thing and is going to last 30 years. But if somebody's looking to sell the building in a year and a half, he doesn't care if it's going to last 30 years. Then he gets up from the table and leaves and the maintenance engineer shows up. And he doesn't care that the guy's going to sell it in a year, he wants it to last 30 years and wants to be able to access it easily. We're always needing to switch our focus to respond to the needs of the person we're talking to.

Q: Talk to me about your problem-solving process.

Line: What you find out is, fluid flow in engineering school is a really technical thing and it's all complicated equations with a whole bunch of lower case Greek letters. And you come out and find yourself in the real world. And if it's air between this temperature and that temperature, or water between these two temperatures, then all those lower case Greek letters become 1.08. And the calculation distills down to multiplying by 1.08. But understanding the technology behind it or the theory behind it allows you to go to the next level. And the problem solving mentality that we came out with sort of separates you from the people that you can train to do that, but who don't understand why they're doing it. Things aren't as complicated in application as they are in engineering school. But the ability to go beyond and translate that into something that's specific or more tailored to the needs of the client is maybe the next level.

Q: Does that mindset ever get you in trouble?

Line: I don't know, probably at home more than at work. [LAUGHS] Maybe looking at everything too, you know, definitively and theoretically. My wife doesn't look at problems that way and isn't necessarily interested in the methodical approach to a logical conclusion. Sometimes things just aren't logical and don't need to be. And you have to have the ability to

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adapt to that. Some owners aren't logical, some clients aren't logical. And you can't necessarily walk them through a well-defined path to a solution that seems to make the best sense when there's some underlying political or strange business reason that you don't understand. That's where our skill is, in trying to identify or trying to figure out just what that is, or what an owner's needs are or what a client's needs are or whoever you are that you're dealing with. Switching off the methodical approach for a minute until you understand what all the issues really are. Then, applying it in a slower and more measured way.

Q: What have been the different transitions since you've left school. Whether it's different locations or Syska & Hennessy or other. Go through those and give us a little context. What were the important factors?

Line: We were in New York for four years and we were on a four-year cycle my whole life growing up. So, "Four years, time to move," we went to Los Angeles. I sort of fell into a lot of opportunity in New York in just the projects that I was involved with. You know, the other staff or the other people that were on the projects -- I was able to do some things that I may not have been able to do with some other people. I was given some opportunities, thrown into, you know, some situations that enabled me to do some different things. Moving out here was sort of similar in that I was able to come out and run projects faster than maybe I could have in New York. And assume more responsibility in a different type of market. Los Angeles is maybe a less traditional market in the design and construction community in that our competitors were different. Contractors are doing design work out here. They weren't in New York. It was much more the way work was done in the '60s and '70s. So you could come out here and be more creative about how you package services. Maybe sell fewer services because that's what an owner wanted, or he wasn't interested in paying for the full breadth of traditional design services. So you could come up with creative solutions and quick ways to do things that satisfied their needs but were different from maybe the way our office back east did work. We were able to become successful and more responsive to the needs of the market. And actually grow in a declining market. Most of our competitors got a lot smaller during the late '80s in Los Angeles, where this office went from 45 people to 100 people during the same period of time. Doubled in size and probably more than tripled in dollar volume of fees collected. While our competitors were going out of business or were going to 30 hour weeks or whatever. That allowed us a lot of opportunity in creating new ways to do things and different ways to do things. Moving to Chicago, like I said, was mostly for my wife's work. But. I also saw it as an opportunity for me to go to work for a different type of company. And I'd always been frustrated by the traditional viewpoint of an engineer in the design and construction community, of having a certain place. Always feeling like I had maybe more to offer on a project but, "Well, when we get to the mechanical, then we'll come and talk to you, but we're talking about granite today and we're not interested in your opinion." But the same sort of creative or thought process or problem solving approach can be applied to really any discipline. So, going to work for a different type of company -- maybe an A&E firm -- would give me the ability to contribute in other disciplines, not mechanical or electrical. It was fun for a while, but I was having more fun in the structure of this firm and decided to come back. In doing something different in a design/build application, it enables us to run an entire project. If there's architecture on one of our projects, we'll hire an architect. We won't work for the architect. Or we'll hire the structural engineer; we'll hire all the contractors. We'll bid and contract with subcontractors. That gives us a higher degree of control on a project and allows us to work at a higher level with the client. As opposed to just with his systems manager, we'll work with the people that are funding projects and deciding where to spend their dollars.

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Q: What do you find is the most fun?

Line: Dealing with all the different aspects of a project. Being able to sort of take responsibility and manage all of that from the financing of a project through, you know, the actual painting and finishing, that's a pretty neat thing.

Q: What do you look for when you hire an engineer?

Line: One of the big things is communication skills. There's no question that you have to be a good solid engineer and technically capable and confident. But one of the biggest things we look for here is communication skills. And being able to, you know, work and be responsive -- work with and be responsive to a client. And be aggressive and take risks and be out there, in order to be a level above all the other people that can be competent engineers.

Q: What about professional certification?

Line: Basically, it's the price of admission. You know, at a certain level, you just don't get there if you're not licensed. And it's important -- you can be just as talented an engineer possibly without a license, but it's the validation that you need to really enter at certain levels of certain types of projects.

Q: What parts of the job do you dislike most?

Line: Well, there's always stuff. Maybe what frustrates me is the money that you could make on places like Wall Street or in the legal profession or whatever, for the professions that maybe aren't as well respected as engineering to the general public. And we've sort of positioned ourselves as not being the best business people. You can be a great engineer and not be able to bill more than \$30 an hour or not be able to collect for 90 days. And it's just because you're just not a good businessperson.

Q: OK. How about advice to students?

Line: You need to look at a lot of different alternatives in a lot of different industries to really try to take the time to understand them. There's a lot of things about the design construction industry that I had no perception of until having been in it for some time. And there's a lot of things about a lot of industries that school doesn't prepare you for. If there's some way you can gain some of that, through co-op work or trying to get out there and meet people, talk to people that do different jobs, things that you think you might be interested in. Trying to look at everything with a potential real-world application, even the most theoretical parts of the curriculum. The theoretical parts are important and you need that as a base in order to go beyond what you can learn just in a training program versus an education. But I've found things much more meaningful if I have some end in sight, or knowing how can I use this outside

Q: What did you know how to do in engineering school and what do you know how to do now?

Line: Maybe I'd go back and take things more seriously, instead of just trying to get past them and move on. There's a lot of things I wish I'd spent more time thinking about while in school.

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