



Sloan Career Cornerstone Center

Profiles of Aerospace Engineers



Matthew W. Doan

**Design Engineer
H.O. Mohr Research & Engineering
Houston, TX**

Education:

BS, Aerospace Engineering, Texas A&M University

Job Description:

Design engineer and project manager, focusing on offshore field development, pressure vessel systems and stress analysis, and wellhead systems.

Advice to Students:

"I think co-op and getting some summer work experience is really important."

Comments:

Matt was given major project responsibilities right from the beginning -- writing proposals, working with clients, and implementing projects. He feels that this has been a tremendous growth experience for a young engineer.

Video Transcript 1:

"It's very loose here. You have the opportunity to make or break yourself, basically. You take on as much responsibility as you can handle, and you are project manager almost immediately on your projects, where in a lot of companies you don't get that opportunity immediately. So you have to be very hands-on, very personable, and you have to have some business sense as well, because you can't go too far over on your budgets. And we write proposals -- I was writing proposals from day one here."

Interview:

Q: Matt, if you could just give me your full name, your age, the company where you work, and your exact job title.

Doan: OK. My name is Matthew Doan. I'm a design engineer for H.M. Moore Research and Engineering, and I'm 26.

Q: Matt, what is the highest level you achieved in school? Just your baccalaureate?

Doan: Yes. I got my baccalaureate degree. I began my Master's degree, but I decided that going in the industry would be better for me.

Q: Did you like college?

Doan: I enjoyed it. It was a lot of fun.

Q: Do you feel it helped prepare you for this job?

Doan: Oh, absolutely. What it gave me was the background and the theory. I'm a very hands-on person, and all throughout my childhood I was always accused of taking everything apart. Now, I know why things work, and that's what I think makes engineering perfect for me.

Q: Was this your first job out of school here?

Doan: No. I worked for another engineering firm for almost a year. It was very small. It had about four engineers. And I wanted to come to a larger environment. So, I knew of H.M. Moore through Texas A&M.

Q: Do you pretty much do the same things?

Doan: Yeah, most of it's sub-sea engineering, predominantly design and analysis.

Q: When you were in school, Matt, did you co-op? Did you have any engineering experience before you graduated?

Doan: Yes and no. I worked for DuPont for a while. That was more of a civil engineering type position. I actually helped design road bases. My degree is in aerospace engineering. So I was doing civil engineering work and getting a degree in aerospace engineering. But, it gave me a feel for what the industry was like.

Q: So you were in aerospace engineering?

Doan: Yes.

Q: And, now you have your degree in mechanical?

Doan: No, I have my degree in aerospace engineering. And most of my electives that I took were mechanical engineer electives.

Q: So how did that come about? Just explain how you got into mechanical engineering.

Doan: Well, aerospace engineering and mechanical engineer are very similar. Aerospace, you focus more on fluids and structures, and my emphasis in school was structural analysis. And, obviously, in mechanical engineering, that all meshes together well. So, in the aerospace industry, as I got to the point where I wanted to graduate, or where I was getting to where I was going to graduate, I found that the aerospace industry wasn't what I wanted, and I wanted a more hands-on industry. I'm a very hands-on person, so coming into the oil industry/sub-sea industry was very natural for me, and especially coming into an environment like H.M. Moore,

it's very hands-on. We get to design in the office, and go out and test what we design in the lab and put it together. So it's very much a "turn key" type engineering position.

Q: How would you describe the atmosphere here? I mean, is it pretty laid back?

Doan: It's very loose here. You have the opportunity to make or break yourself, basically. You take on as much responsibility as you can handle, and you are project manager almost immediately on your projects, where in a lot of companies you don't get that opportunity immediately. Here at H.M. Moore you get that immediately. So, you have to be very hands-on, very personable. You have to have some business sense, as well, because, I mean, you can't go too far over on your budgets. And we write proposals. I was writing proposals from Day One here. So, it's very much a high responsibility position, but very laid back in the extent of what you can do. I mean, you do as much as you can handle.

Q: Did you find it easy to fit into the corporate climate here?

Doan: Easy, very easy. It was no problem at all.

Q: OK. Tell me about a typical day. How many hours you might typically work, and how your day might be divided up, how much time you spend, say, on the computer, how much time you spend actually more hands-on?

Doan: It's very project-oriented. For instance, last year we were on about a nine-month design project, so I spent anywhere from eight to 12 hours a day in front of my computer working on Auto-CAD and Math-CAD, you know, doing analysis, doing design. Lately I've been doing a lot of lab projects. We've designed some lab fixtures. I helped design the fixtures, and then I'd go out and we'd actually physically install the fixtures and run the tests. So, lately it's been about 50-50 in the office, and out in the lab. That's why our dress is very casual, because you never know when you're out in the lab. Some guys wear ties. I typically choose not to, just because I'm out in the lab a lot.

Q: What about this Auto-CAD and Math-CAD? Did you learn these programs in school?

Doan: I learned them in school. Auto-CAD is a very powerful design and drawing program, but you'll find once you get in your niche in industry, a lot of things these programs can do, you don't necessarily need. But basically as a design tool is what I use Auto-CAD for. And Math-CAD -- I perform my structural analysis with it. Basically, I write libraries and libraries of structural routines, and I just pull them up and I use them. So, all the Math-CAD routines I've used, I wrote them all first. It's kind of like a computer program, is what it's like.

Q: What other software programs do you use?

Doan: Those are the two main ones I use. I've used structural-analysis programs such as Finite Element Analysis, and the specific programs I've used are PAL-2 and ALGOR. I've used those on more rare occasions. Mainly Auto-CAD and Math-CAD. Of course, spreadsheets. I consider word processing and spreadsheet as just "common day" things. We use those all the time. But as far as specialty programs, mainly Auto-CAD and Math-CAD are what I use.

Q: What about travel, Matt, in this position? Do you spend a great deal of time travelling?

Doan: I usually travel about once a month or so. I go to New Orleans a lot. Being in the sub-sea industry, a lot of the sub-sea is focused out of New Orleans, so I go to New Orleans a lot.

I just got back from a trip to Phoenix working for a company on some rotational equipment. I've been to North Carolina. Not a lot of guys get the opportunity to travel, but I have.

Q: Have you been able to be on board on any international projects, or do you foresee any in the near future?

Doan: I've worked very indirectly on a couple of the China projects. But, no, I haven't. There's been some other engineers who typically handle that.

Q: What about in terms of socializing with the people here? Do you spend a lot of time out of work with people from work?

Doan: Yeah, absolutely. There's a kind of a core of people who are anywhere between the ages of 25 and 34 or so, so that obviously is in my age realm and, yeah, we hang out a lot. This environment, it can be pretty intense, so it's not only being good work companions, but I've made some pretty good friends here, too.

Q: Do you have a PE license?

Doan: I will. I have another year-and-a-half. I have an EIT. In another year-and-a-half I'll have my professional engineering license.

Q: What about hobbies, things you do outside of work? What do you spend your time doing?

Doan: (HE LAUGHS) I brew beer, for one, and that's a lot of fun. Being in Houston, there's a lot of water sports. I like water-skiing. Of course, most of my socializing is, we spend a lot of time in bars and things like that, but a lot of water sports and stuff like that.

Q: Do you have any brothers and sisters, Matt?

Doan: I have a brother, an older brother. He's an architect here in Houston.

Q: So, you're both kind of doing something along the same lines in a sense?

Doan: Yeah.

Q: Do you think that was how you were raised?

Doan: Yeah. My dad is a mechanical engineer, and I think I got a lot of my mechanical aptitude from him. My mother is very educated. She has a couple of degrees, one in history and in government, and, so, yeah, education was a pretty big deal in my family, and they pushed us pretty hard. But as far as mechanical aptitude, probably, by far, my dad pushed me into that. I was naturally brought into that.

Q: What's the best part of your job here? What do you really like about your work here?

Doan: I'd say the best parts are being able to do everything. You're never bored with one part of your job. You constantly are moving from item to item. Whether you're designing in the office, or you're out in the lab, you're constantly doing something different. That's the best part. There's not one thing I enjoy most. I like to do a lot of things. That's why this is a perfect

position for me, because I would be completely bored sitting behind my computer all day, or I'd be completely bored out in the lab all day, so the variety is the best part.

Q: What's the worst part?

Doan: Sometimes, some of the lack of structure is the worst part. Sometimes, there's an "over amount" of responsibility on you. You're really on the line sometimes, and, you know, in a larger corporation you wouldn't necessarily have those types of responsibilities.

Q: What about in terms of overtime? I get the impression people here work a lot of hours.

Doan: Yeah.

Q: Is that hard for you? Can you just talk a minute about working all this time, and having a personal life and a social life? That must be a bit of a challenge.

Doan: You make your own hours. It's hard working a lot of the hours. Sometimes, we have some really big projects going and we have to work all night, or we have to work, you know, two and three weeks straight, working ten, 12 hours a day. That happens pretty rarely, but most of it is on you, it's your responsibility. And you can monitor your time. I can come in at five in the morning and leave by six at night and not affect my life too much. A lot of it's my own responsibility, though. You have your time frame. You know what you need to get done. But as far as lab projects go, some of those have to go all night, and you're more at the mercy of the customer. So, in some respects that affects your life, but it's very, it's rare to have to do that. I would say those types of projects come in the door once every three months or four months. So, it's not like it's a weekly routine.

Q: In order to get your projects done and meet deadlines and things like that -- budgeting, everything that's involved in all you do -- who do you have to work with, and how closely, and how important are they to you getting the job done?

Doan: If it's a lab project, I try to remove myself a little bit from the lab and handle most of the engineering aspects. If it's a lab project, I rely a lot on Gary Steck and Glen McFarland and some of the technicians, Bill Tuttle, Troy Baker. These guys basically, they make or break you on a lab project. These guys can really help you out in some respects. As far as the engineering projects, there are one or two engineers I consult with, such as Andy Jeffreys, our engineering manager, he's a fantastic engineer, and he can save you on some projects. I work with him a lot on some of the offshore stuff we do. But in the lab, all those guys in the lab, they're the best. They're crucial on making a project work.

Q: You're bringing an interesting slant, because you were in aerospace, so what do you like about mechanical engineering? Is this where you see your career path going?

Doan: Absolutely. Mechanical engineering is the most generic. It's hard to say what is aerospace engineering and what is mechanical engineering. To me, it's the opportunity to be able to "turn-key" a project. If I design something, I can design it, I can build it, I can watch it work, test it. To me, that's engineering. And, so as far as my aerospace background, I think I have a little bit of a "leg-up" on people as far as the structures. I have a lot of structural analysis that other guys, other mechanical engineers didn't get, so I have a "leg-up" to that extent. But, on the other hand, mechanical engineers tend to be a little more practical, too. So, yeah, by far, mechanical engineering to me is more hands-on. You know, the guy, the

shade tree mechanic, the guy who wants to get dirty under his car on the weekend. That's what it is to me.

Q: If you don't fix your car, you don't work here.

Doan: Yeah, exactly.

Q: You're not an engineer.

Doan: Yeah. I mean, to be a good engineer, you've got to get dirty. It's my attitude.

Q: What has surprised you since you've gotten out of school and started in the working world now?

Doan: How much more I like working than I liked school. I mean, in school, the theory is very interesting and everything, but the work, when you finally get into a project and you really get to do something, that's what it's about.

Q: How would you describe your lifestyle now, Matt? So, you're a single guy who's doing OK?

Doan: I do a lot of things. I like to travel a lot. Being single and everything gives me the opportunity. I go out a lot, I travel a lot. I make fairly decent money, so I have the opportunity to do some things. And, like I said, my brother and my dad live here in Houston, so I do a lot with them. We like to go out. My family has a ranch up in the panhandle of Texas. We go up there a lot, and we'll ride horses, we'll build fences. That's the kind of stuff we do. And I'm pretty laid back, you know. The most fun I have is traveling, though. I go to Colorado, ski, go to New Orleans. Things like that.

Q: What if you could take all you know now and go back to, say, your sophomore year of college? What do you wish you had either paid more attention to? Is there anything you would do a little differently?

Doan: I wish I had taken my education a little bit more seriously. I did all right in school, but knowing what I know now and going back, I could be a lot better at what I do. It's hard to know, it's kind of a "Catch 22." You know, "the grass is always greener." You're in school, and you can't necessarily see what's down the road, but once you're kind of "down the road" you see what that's all about. You kind of wish you could go back and re-take that course, and you could really get something out of it. I think co-op and getting some summer work experience is real important, and I didn't do enough of that because I was too bent on getting out of school. I wanted to get out. So I did a lot of summer school and a lot of things like that. But, I think it's pretty important to co-op, because you really don't know. I fell into the sub-sea industry by accident, and I'm glad I did. But, I think if you get an opportunity to co-op you'll say, "Oh, wow, I like this," or, "Hey, this is it for me." But to be an engineer, there are so many different types of engineers. There are guys who like to be hands-on; there are guys who don't like to be hands-on. There are theory guys; there are all kinds. It just depends on what you like to do.