



AMERICAN INSTITUTE OF MINING,  
METALLURGICAL, AND PETROLEUM ENGINEERS

## ORAL HISTORY PROGRAM

**Roberto Aguilera: An Inspiring Career in Petroleum Engineering**

## **PREFACE**

The following oral history is the result of a recorded interview with Roberto Aguilera conducted by Glenda Smith on September 30<sup>th</sup>, 2019. This interview is part of the AIME and Its Member Societies: AIST, SME, SPE, and TMS Oral History Project.

## **ABSTRACT**

Growing up in Bogotá, Colombia, Roberto Aguilera was exposed to the petroleum industry at a young age through his father's work as a roughneck for Exxon. The influences and advice from his father encouraged him to study petroleum engineering at the University of America in Bogotá. Aguilera has had an extraordinary career working in Colombia, America, and Canada and traveling the world as an SPE distinguished lecturer. During his career, Aguilera's research was focused on naturally fractured reservoirs, which he brought to the forefront of petroleum engineering. He is now a Professor of Petroleum Engineering and CNOOC chair in Tight Oil and Unconventional Gas Engineering at the University of Calgary in Canada. Aguilera has achieved earning his PhD, writing the first book in the world in petroleum engineering, and starting his own consulting company. The experiences he has had as an SPE member, from conferences to serving as an executive editor of the SPE Journal, has benefited his career, and Aguilera continues to promote the opportunities made possible by SPE membership. Listen to his oral history as he shares his love of SPE, career journey, and advice for the future generation of the petroleum industry.

Readers are asked to bear in mind that they are reading a transcript of the spoken word, rather than written prose. The following transcript has been reviewed, edited, and approved by the narrator.

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## **00:47 Growing Up in Bogotá, Colombia as the Son of an Exxon Roughneck**

Smith:

This is Glenda Smith, Vice President of Communications for the Society of Petroleum Engineers. I'm here at SPE's [Society of Petroleum Engineers] Annual Technical Conference and Exhibition in Calgary, Alberta, on September 30<sup>th</sup>, 2019, with Dr. Roberto Aguilera, Professor of Petroleum Engineering and CNOOC Chair in Tight Oil and Unconventional Gas Engineering at the University of Calgary.

Roberto, tell me a little bit about where you grew up.

Aguilera:

Thank you, Glenda. I was born in Villavicencio, Colombia, in September of 1945. My father was Carlos Aguilera. He was a roughneck working for the oil company, Exxon. At the time, it was called Intercol in Colombia. My mother was Beatriz Guevara, and she would spend most of her time at home with my brother and I. The work of my father as a roughneck was cutting trail for geophysical crews of Exxon and also cooking for those crews. To do that, he would have to go to the rivers, the creeks, get water, bring the water to the camp, boil it, and prepare the food for these crews. He was really good. I tasted his food later on in life, and it was good. And, he was so good that the American engineers and geophysicists, they will ask my father, "You have to come with us." To the managers of the company, they would say, "Send us the Chinese cook."

The reason was because my father has a little bit of Chinese, so his eyes were a little bit like Chinese. So, that was excellent. Three years after I was born, there was a real bad incident in Colombia. A political leader by the name of Jorge Eliécer Gaitán was murdered in Bogotá. That started something that was pretty close to a civil war in Colombia, and we live the effects of that up until today. Because of that, we were displaced from Villavicencio. We had to move to Bogotá. Basically, with nothing, [we] had to rent a couple of rooms. In one room we would sleep with my mother and my brother. The other room would be a kitchen.

So, the starting was a little bit rough, but, eventually, thanks to the good work of my father and my mother, everything turned out fine. I have to say they made a fantastic team. Also, while growing (up), I played a lot of soccer. I became pretty good at playing soccer. I was a goalkeeper of the high school where I was studying. I was also a goalkeeper of the University of America, where I took Petroleum Engineering. And, I was close for a little while to become a professional, but actually, I was not good enough, so that was the end of my soccer career.

## **03:40 My Influence to Become A Petroleum Engineer – Great Advice From My Father**

Smith:

So, who or what influenced you to become an engineer?

Aguilera:

Well, that's an interesting question. I have to say that it was my father. In one opportunity, my mother, my brother, and I went to visit him in one of the areas where he was working. When I saw him, I was really impressed. I said, "This is what I want to do when I grow up." So, my father told me, "You can do better than that, you can become a petroleum engineer. Then, if you want to do even better than that, you have

to learn English." The reason he told me that was because he said, "I have witnessed the engineers that do well, and usually they are able to communicate with their managers, which at the time were all American. The engineers that do not speak English, they struggle, and then they get sort of stuck." So, it was [a] great piece of advice from my father, with respect to studying petroleum engineering and with respect to learning English as soon as possible.

Smith:

So, while you were pursuing your engineering degree, which petroleum engineering was not common in Latin America at the time, were any of your professors particular mentors to help you along that path?

Aguilera:

Yes, I went to the University of America in Bogotá, and there were two main reasons for that. One was they had a very good petroleum engineering program, and the other reason is it was in Bogotá. Since we were living in Bogotá, it was less expensive to do it there rather than going to another city. There was a professor at the University of America by the name of Alonso Marin, who was my professor of Reservoir Engineering. He was instrumental really in helping me through my studies and encouraging me to go to graduate school later in life. There is an interesting thing that happened at that time. The University of America requested the students to take one of two [elective] courses. It was either go and take martial arts or go and take theater.

So, I decided to take theater. It was very interesting because I learned some of the techniques, and some of my classmates that continued on that line of work eventually became big actors in Colombia and actresses. They did movies, and they did television. I went the way of petroleum engineering, which was great, no regrets, but it's interesting how these things work. Once in a while, because I was doing that [theater], I will arrive late to my class of reservoir engineering and my professor Marin will be a little bit mad, but he understood. He knew that if you want to be able to engineer, you have to do other things in life. And, in my case, it was doing some theater; that worked out pretty good for me.

### **06:57 Coming to the United States and Forming Relationships with Professors**

Smith:

That's a great story. So you came to the U.S. for your graduate work, what was that transition like? Was it a bit of a culture shock?

Aguilera:

Well, the transition went rather smoothly, and that goes back to the advice from my father, because I studied a lot of English in Colombia. When I came, I didn't have too many problems. Plus, I came for six weeks to Washington, DC, took six weeks of English, and then that helped me a lot. When I went to Colorado School of Mines, I met a man by the name of [Doctor] Hank van Poollen. Then, when we shook hands, this is pretty amazing, but we felt good, we were friends from that moment. The same thing happened with another one of my professors, Doctor George Pickett; I shook hands with him, and we became good friends. So, I was lucky because I had two giants of the oil industry who were my professors, and that really is the way I developed my profession later on. That's why I do a lot of hydraulic fracturing, and I do a lot of simulation, and well testing, and petrophysics without too many problems because really, I had excellent professors in all those subjects.

Smith:

Indeed, you did. So, after college, you went to work in industry. Tell me about that first job and what kind of challenges you faced there?

Aguilera:

Okay, that was very interesting. I finished in 1967 in Colombia, and I went to work for Texaco [in Colombia]. Everybody wanted to work for Texaco because the training was excellent, and truly we were spoiled. At that time, Texaco had an airplane, and they would send a taxi to my house on Mondays, at five o'clock in the morning. They would take me to the airport, to the hanger of Texaco, fly to the oil field, [and I would] do my work. Saturday morning, they would fly me back to Bogotá; a taxi there [would] take me home, and that was repeated month after month. So, they really spoiled us a lot, but we had to work very hard. also. But, the training was excellent in the field, in the wells. They would take, for example, a roughneck from the drilling crew, and then we will go to replace the roughneck, us engineers, so I will actually learn on the floor. So, I did a lot of things, even derrickman, many things that were very interesting, fantastic training. So, in that sense, I was also very fortunate.

### **10:00 From Industry to Teaching – Writing the First Book in the World in Petroleum Engineering on Naturally Fractured Reservoirs**

Smith:

Yes, that would be great training. So, what led you from industry to teaching?

Aguilera:

Well, when I started my company, one of the activities that I did was teaching industry courses. Back in 1980, I wrote the first book in the world in petroleum engineering dealing with naturally fractured reservoirs. When I published that book, the publisher told me they printed 3,000 copies, and they were gone in about two weeks. So, all of a sudden, I start receiving telegrams, telexes, things of that time from Indonesia, from China, from everywhere, asking me to go and teach some courses, to talk about naturally fractured reservoirs.

So, I was very fortunate. For example, I went to China when they opened their doors. There were no [tall] buildings. Most of the men and women were dressing with the [Mao suit] style, many bicycles in there, probably millions of bicycles, very few automobiles; so, I saw that. The interesting part is that I go many times to China. [I] have been going throughout the years, so I have seen the progress of the Chinese. It keeps going, progressing, building, beautiful fashions, everything that you find in other places of the world but at the beginning was not like that. So, that was quite an interesting experience there. So that's thanks to the book. So, teaching them was great, and that guided me then to eventually [after many years] become a professor at the University of Calgary.

Smith:

What do you find most rewarding about being a professor?

Aguilera:

That's a great question, and really, I can give you a very easy answer; it is my students, by far, no contest, is

the students. It gives me great pleasure training the students, seeing them mature, becoming good at what they do, and that's really great seeing them going into the workforce. I've been very fortunate that my students, all of them, are working, even in these hard times. But, that's really the big pleasure. All things at the university are good, but they don't come even close, it's just the students.

Smith:

Okay. How do you view your role in terms of helping to build the pipeline of qualified future employees for the industry?

Aguilera:

In my view, the key to success is being able to run calculations on the back of an envelope and also using sophisticated models. So, the way I try to train my students is by telling them equations are important, laboratories are important, but it is critical that you connect with the real world. And, sometimes in industry, we don't have the time to do the fancy simulation, the sophisticated study, and we may have to do decisions very quickly. So, that's where this idea about back of the envelope calculations come into [play]. So, that's what I try to instill in my students, practical work so that they can be well-received by industry.

Smith:

So, you also teach graduate students in Russia. How did somebody from Colombia, who was educated in the U.S. and lives in Canada, come to teach in Russia?

Aguilera:

Yeah, it's part of the same story that I was telling you about my traveling. I have a couple of good friends, Dr. Raj Mehta and Dr. Gordon Moore, who had been in Russia. And then, they talked to some of the professors in there about me, and then I received the invitation to go and present courses in petrophysics and in well testing. That was a great experience, and now some of those students are at the University of Calgary, also doing some graduate work. So, it's the way to go, if we want a beautiful world, a peaceful world, we have to collaborate with each other, and then everything will be fine.

#### **14:42 Naturally Fractured Reservoirs – “A Beautiful Topic to Study and Research for Your PhD”**

Smith:

That's great. Your contributions have been in the area of naturally fractured and unconventional reservoirs. You wrote the first book. What drew you to those topics?

Aguilera:

Okay, I think it's a little bit of luck, accidental. This goes back to the first one, Dr. H. K. van Poollen. van Poollen used to work for Marathon, and he resigned to start his own consulting business. Then, he went to also teach at the Colorado School of Mines. Once, as part of his consulting, he went to Iran. There are many naturally fractured reservoirs in Iran, and, while he was there, he was asked questions. So, when he came back, he told me, "I answered the questions, but, really, I didn't feel fully comfortable." So, he asked me to go to do a literature survey at the library, and I used some old books. They were called the Abstracts of the University of Tulsa. I started looking at all of these books, and then, when I finished, I realized that there

were only a few papers on the topic of naturally fractured reservoirs. So, I went, and I told van Poolen, "This is it."

He said, "There is a beautiful topic to study, to research for your PhD, and so on, naturally fractured reservoirs." So, I started working with that, and I liked the topic. When I finished my thesis, finished my PhD, I continued working with naturally fractured reservoirs, which I do to this day. So, it was sort of accidental. But then, when I came to work in Quebec; I was invited because I have written these articles on naturally fractured reservoirs. At the time, René Lévesque, who was the Premier of Quebec, wanted to split from the rest of Canada. So, he wanted to do an inventory of resources in the province. At the time, I was working in Argentina; I married in Argentina. My wife is from Argentina; my daughter is from Argentina. Then I received this telegram. So, in this telegram, they said, "Well, you have written some articles. Would you be interested to work in Quebec?"

So, I said, "Well I will go and talk to you," and so on. When I left for this particular interview, Buenos Aires, it was minus 40 [degrees Celsius]. No, it was plus 40, And when I arrived in Montreal, it was minus 40. So, it was a change of 80 degrees. I moved from there, from Montreal to Quebec City, a beautiful city; I fell in love with the city, had the interview. They made me an offer I couldn't resist. Then [I] went back to Argentina, got a visa very quickly, and ended up working in Quebec with shales. At the time, the shales were being produced only in the Appalachian Basin. There was a company called Colombia that was producing a lot of this [gas].

So, I became [involved] in work with shales as soon as I came to Canada, and then I realized shales and naturally fractured reservoirs, they go one-on-one; it's just that the scale of the fractures is different. So now, actually right now, I'm finishing a paper that I will present at the Lacpec in Bogotá next year [2020], which is called "Naturally Fractured Reservoirs and their Link to Tight and Shale Reservoirs." Basically, I have put everything in words, and I think that's going to be very useful.

Smith:

It does sound like linking those would make a lot of sense. Following up on something you said about the naturally fractured reservoirs in Iran, have you ever worked in Iran?

Aguilera:

Many times. I was invited to do consulting in Iran, sometimes for the Iranian company, sometimes for companies that were not Iranian but were doing some work in there. Then also, there was an agreement between the University of Calgary and the Petroleum University of Technology in Iran. So, as part of the agreement, then I would go sometimes to teach courses in Iran, in Tehran. That was a great experience. I was also in Iran doing some consulting in Ahvaz at the time of the war between Iran and Iraq, a long time ago. That was a great experience, also scary but very interesting experience.

### **19:40 Bringing Naturally Fractured Reservoirs to the Forefront of Petroleum Engineering**

Smith:

You've been writing and lecturing on unconventional reservoirs long before this recent focus on them. What's changed to bring them to the forefront?

Aguilera:



Essentially, the creativity of the oil industry, particularly the development of good techniques for drilling horizontal wells and good techniques for multi-stage hydraulic fracturing. I think those two things are the ones that brought shales to the forefront, but shales have been producing for a very long time. There is, for example, a field that is called Big Sandy Field, that has been producing [from] shales since 1916 or something like that, long before hydraulic fracturing was invented. The Appalachian Basin also had been producing for a long time. So, the technology is new, but the shales have been around for a long time. One of the things that we try to do, and I try to do with my students, is make them realize of all those experiences and all that knowledge of the Department of Energy in the Appalachian Basin, trying to use that in the current shales that we are producing. But, sometimes people forget about those ones. But, they are there, and the data are there.

Smith:

In 2018, you were the editor of a multi-author book for SPE on unconventional gas and tight oil exploitation. What motivated you to pull together the expertise to put together that book?

Aguilera:

Essentially, my experience with the shales in the Appalachian Basin [and] seeing all the advances, I thought that it would be worthwhile to put [together] a team of experts in different areas, for example, in geology, in geomechanics, in drilling, in log interpretation and well testing and reservoir engineering, hydrates. It was a good decision. I invited some experts on those areas. They agreed to come, and they produced what I think is an excellent book. So, I hope this will be around for a long time because the basics of what we are doing are in the book.

#### **22:14 Executive Editor of the SPE Journal – Peer Review and Polishing Papers**

Smith:

You're currently one of the executive editors of SPE Journal, and, in the past, you served the same role for the Journal of Canadian Petroleum Technology. Talk a bit about the peer review process and what it means for academia and for the industry.

Aguilera:

That's a great question. I like to compare, it might be odd, but I like to compare peer review to democracy. Democracy is imperfect, but it's the best we have in the world. And, peer review is imperfect, but it's the best we have to get [move] all of these papers forward. The process, I think, is very important, it's very well-done. It starts with administrative work by SPE staff, and they try to filter all these documents, and then the documents are listed. Then, the executive editors, I am one of those, look at the titles, look at the abstracts. And then, we say, okay, this is a topic in which I feel comfortable; I'm going to select this paper. I select a paper, other executive editors select other papers, and then we send them to the associate editors.

We look for an associate editor that is an expert on this particular field. The associate editors, most of the time, they accept the job. If they feel not comfortable, they say, okay, present it to somebody else. Once they take the paper, they review it, and then they send it to three or more technical editors. So, the people that review the papers [do so] in detail.

Then they [technical editors] provide some ranking of the papers, some recommendations. [For example] Yes, it's good, It's not good. It goes to the associate editor. The associate presents then a recommendation

to the executive editor. This recommendation says, okay, this paper is not good; it should be declined, or it is a good paper, but it requires major changes, or it requires minor changes.

Then that's sent to the executive editor. And then, the executive editor does a revision with respect to the paper. So, it's a very complete process; we have a lot of excellent papers. One of the problems that we have had in the past has been the language, because we are an international society, and many of the writers don't have the necessary skills. But, sometimes, the papers are so good that it's worthwhile to go through the exercise of polishing the papers. And, that's where the staff of SPE does a fantastic job polishing a lot of these papers.

#### **25:04 Biggest Technical Challenge – We Cannot See the Reservoirs**

Smith:

Thank you. So, switching gears a little bit, what are some of the biggest technical challenges you've experienced during your career?

Aguilera:

I think the biggest challenge probably has to do with the fact that we are working with reservoirs that we cannot see. Because of that, we have to rely on direct and indirect sources of information. Direct sources of information include, for example, cores. We can cut a core, we see the core, touch the core, smell the core. Also, there's [drill] cuttings. So, we can examine those little cuttings, but that's pretty much all the direct sources of information that we have. Everything else is indirect sources of information, like well logs, well testing, micro seismic data. Any time we are going to work with indirect sources of information, then we have to use equations. We have to make assumptions to develop those equations, and those assumptions might apply or might not apply to the reservoir we are dealing with. So, it's very difficult to dream how is a reservoir there at 10,000 feet; but, we have to do it. Generally, we do it quite successfully. But, I think that's the biggest challenge, trying to connect with the reservoir down there to try to improve recoveries, improve production rates, and so on.

#### **26:43 My Consulting Company and a Son Following in My Footsteps**

Smith:

That's a great answer. So, in addition to teaching, you also have your consulting company. That means you've really worked across many different parts of our industry during your career, looking at things from many sides. What's different about those different perspectives, and what aspect of the industry do you find most rewarding?

Aguilera:

That is correct. And, I think that goes back to these professors that I had that taught me about so many different things so well: petrophysics, hydraulic fracturing, completions, reservoir engineering, [and] simulation. Because I learned about all of these things, then when I went into consulting, I was able to tackle all of these problems and look at them from different perspectives. So, I don't specialize on one topic. I do many different things, but on a kind of reservoir, naturally fractured reservoirs and shale reservoirs, and that gives me a good perspective. So, I go to any place around the world, and I'm able to talk to the geophysicist, the geologist, to the drilling engineer, reservoir engineer in pretty clear terms. And, that has helped a lot in my consulting business.

Smith:

You have a son, also named Roberto, who's followed your footsteps into our industry and into teaching. So, tell me a little bit about that and how you felt when he chose oil and gas as his profession.

Aguilera:

My son Roberto, middle initial F, was born in Quebec, when we were living in Quebec. And, he went to school at the University of Calgary. He went to the Haskayne School of Business, got a degree, Bachelor of Commerce, worked with my company, Servipetrol, Ltd., for a little while. Then, when he decided he wanted to do a masters and a PhD in energy economics, I recommended him to go to Colorado School of Mines, where I had been because they had a great program on energy economics. So, he went there. He did very well, met some great professors, also, then wrote a book called The Price of Oil with one of his professors. The book did extremely well, and one of the interesting things is that, when the oil price was about \$130 or \$140, his work and the work of some of his professors indicated that the oil price was going to go down, that it was a bubble, that it was going to burst; and, he was right.

Then, because of that, the book was very successful. It was acclaimed in financial circles. Because of that, then he ended up being a Distinguished Lecturer of the SPE. That was great for me. I felt really very proud when I saw that he had been selected to do that on a topic that is so difficult, because talking about the oil price is very difficult. It's very complex, but he did handle it very well. I hear from some colleagues in different places around the world, and they said he did a very good job. As part of this, he has spent a few years working in Vienna for OPEC. He was co-author of the OPEC Outlook for several years and very well received. Then, once he left OPEC, then he went back to Australia. He's now in Perth, working in the Oil and Gas Innovation Center at Curtin University. So, he's a young person but very dynamic. He's doing very well. So, I'm very proud of everything that he's doing.

### **30:42 Exciting Experiences as an SPE Distinguished Lecturer**

Smith:

So, you were also a Distinguished Lecturer in 2000 and 2001. Tell me about your experience. Most DLs, I know, have some great stories.

Aguilera:

It's been one of my best experiences with SPE, really outstanding. I had the chance to go out to several countries in North Africa, in Europe, South America, many cities in the United States. I think I made about 27 presentations. Something that was fun for me, actually going back for a second to my son, is that, when I saw the list of cities, he went to two more cities than me, and I was excited about that. I said, "Great. Way to go."

But in any case, the experience was fantastic. I remember getting some instructions from the SPE. They [Distinguished Lecturers] utilized at the time slides; and, they told me, "Take transparencies for a normal [overhead] projector." That turned out to be a great recommendation. These slides worked out well in some countries, but in other countries, they didn't work well because the canvases were different, the sizes were different, some were round, some were straight. So, I had to use, sometimes, my transparencies; but, the lectures went perfect. So, that was a great experience.

One of the things that happened, for example, once, we were landing in Denver. Then [as the plane was] going down, all of a sudden, the plane started to go up. At that time, it was at Stapleton, the Stapleton Airport. So, they closed the airport; and then, we went around a few times, and then, they said we cannot land. It was in the morning; it was maybe nine o'clock in the morning. My talk was at lunch. So, the plane had to go, and I think it went to Grand Junction [CO]. We landed in Grand Junction, so we had to go back [to Denver] by car.

There was no way we were going to end up in Denver on time. So, the decision was, and that was wise, and that was amazing for me, what we are going to do is let's have the lecture at the Colorado School of Mines [my alma mater]. And then, they told the people in Denver, if you can make it, go to the Colorado School of Mines, and the presentation will be there. So, I did it there. All of a sudden, I ended up [with a] big crowd simply because people came from there [Denver], and there were many students, as well. So, that was a fun one.

Another one that was interesting was, I gave a talk in Duncan, and then I had to go next to Wichita Falls in Texas. That night, out on the road, there was a lot of snow. When I opened the door to go out of the motel, well, the airport was closed; and then, I talked to SPE. SPE told me, "Can you rent a car and maybe drive to Wichita Falls?" That's what I did, four-wheel drive, rented the car, and then I drove to Wichita Falls, and I arrived on time. We had the talk. I arrived at about 12:30; [the] talk was at 1:00 or something like that, so I was able to give the talk. So, there are many things that happen like that, particularly in the winter. You know, these things can happen, but it was quite exciting, and it was a real pleasure to go to some places.

This morning, I ran into the person [Vasile Badiu] that showed me around Romania, and it was exciting. We saw each other this morning there, at the SPE Conference, and this man went to pick me at the Bucharest airport. So, of course, when I arrived there, my first question was well, Dracula. And then, he says, "Yeah, and I'm a vampire." He did this [Dracula imitation], and the taxi was dark. So, it was a lot of fun. I got surprised. So, things like that, it's a lot of fun, and it's great to see that the presentation captured the ideas [of] what you are trying to explain. [They] get up to speed with some of the issues that they are not familiar with. It was a great experience being there for the SPE, really great.

### **35:11 A Humbling Honor – SPE Distinguished Achievement Award for Petroleum Engineering Faculty**

Smith:

I've heard that from everyone I know who's been one. So, tomorrow, you're receiving the Distinguished Achievement Award for Petroleum Engineering Faculty. So, tell me a little bit about this and the other honors and awards you've received during your career.

Aguilera:

Glenda, this is very special, because I'm not very good at looking for these things. So, one day, I got this email, and the email said, "We want to propose you for this award." Then, I said, "Well, thank you!" [They responded with] "Can you send us your resume?" So, I sent the resume, and so on. So, a few months later, I received this other email, [it said] "You have received the award." Then, I look at the list of people that have received this award, and, honestly, it really humbles me, because it is pretty amazing receiving this award. So many excellent professors throughout the world, and getting this is very unique. It has to be very competitive because there are many good people in our industry. So, getting it is fantastic. I'm very humbled for that.

Another one that also was very important to me, being from Colombia, was [one] I was given in 2015, the

Innovation Award of the Colombian Society of Petroleum Engineers [ACIPET]. That was good because sometimes it's hard to be a prophet in your own land, but I got it. I'm very pleased with that. In Canada, I received an award, it's called Roger Butler Memorial Award, because I wrote a paper, and it was declared the best paper, at one of those meetings of the Petroleum Society of Canada. So, I have received a few, but there are some that really touch my heart: the best paper award because of the name of Dr. Roger Butler being in there, the Colombian one because I was born in Colombia, this one [The SPE Distinguished Achievement Award for Petroleum Engineering Faculty] because it's outstanding. And then, receiving it in Calgary [makes it] so special, [Smith: "So special."] in front of my Canadian colleagues, and so on, very special.

### **37:23 How A Letter Began My PhD Journey and My Greatest Accomplishment**

Smith:

Very special. So, I didn't have this one in the previous list of questions, so I'm going to hit you out of the blue with this one. Tell me about your proudest accomplishment, personal or professional.

Aguilera:

My greatest accomplishment, I think I've been very fortunate. It's like my path always works well. In fact, sometimes when I get it in the chin, [I] look back, and they tell me [it worked well] in one way or another. But, getting, for example, my PhD was great, because I never thought about it. When I was at Mines, I came for my master's degree, I met [Doctor] van Poolen, and then, he told me, "Why don't you continue for your PhD?"

I said, "Well, I will, but I don't have money." Then, he did something that was very unique. He wrote a letter, and he sent this letter to all the American companies operating in Colombia. Then, in this letter, he told these companies, "I have a student from Colombia. He doesn't have money. He wants to continue for his PhD. Can you help?" So, some of the companies didn't answer. Some companies said, "Well, we can give him a summer job or something like that." One day, we received this letter from Exxon, Intercol, where my father had worked as a roughneck. And, in this letter, they said, "How much do you need?" Then van Poolen said, "This is great," and I was happy.

He said, "We are going to ask only for enough money for you to live decently, for tuition, but not much more than that because, otherwise, you won't study." So, he asked exactly for the amount that I needed. But, that's why I got my PhD, because van Poolen did that. So, I've been very fortunate, and that was a great accomplishment. But I owe it to him and many people that helped me. But, that letter really did the trick; otherwise, no money, no PhD. That was a real accomplishment.

The other thing that I think is great in my life is that I was transferred to work in Argentina. I arrived in Mendoza, and the lady who was in charge of human resources was pregnant, so she had to go on leave. So, they hire this young woman, that I met to do all my paperwork and so, on a part-time basis. She is today, my wife. So, I met her like that. Isn't that amazing? It's fantastic. So, I met her, and then love came in between very quickly, and then we have our daughter there. Then from Argentina, I was telling you, we moved to Quebec, had my son.

Then, we moved to Texas, and I have a son from Dallas, Texas, same wife, three different nations of the United Nations with my kids. My youngest son is a musician. So, he lives in Toronto, but because he's American, he has an [American] passport also. So, he goes once in a while to play in Nashville; so, [he'll] go back and forth. So, it's very fortunate. So many accomplishments, some have been mine, some are sort of

family's, just a combination. I would lie if I can complain. I think the day that I have to go, no unfinished business; I've been a happy, lucky man. Great family, great career, great students. It's a good life, Glenda. It's a good life.

#### **41:06 Being A Longtime Member of SPE and How It Has Benefited My Career**

Smith:

It is indeed; it is indeed. So, you've been a member of SPE for a very long time. You still have a four-digit SPE member number. Most of them are seven. Before the merger with SPE, you were also an active member in The Petroleum Society of Canada. How has membership benefited your career?

Aguilera:

It's been great. My number is 1461 for SPE. My students say they could never do it. So, I tell them, "I'm 74, so that's why." SPE has been great for my career. When I came to Colorado School of Mines, one of my first activities was to become a member of SPE, and it has had great influence in my career in different ways. For example, when I started teaching courses around the world for industry, a lot of the things that you use in those courses was material that was published in SPE journals. When I did my consulting work, and I still do my consulting work, many of my references, I would say most of my references, are really SPE papers. So, it has had great influence in everything that I have done in my professional life. The Society of Canada, it was also great; and they also publish great papers. So, those also helped me. So, I've been fortunate in that respect also. I have been a member of two great societies.

Smith:

If you were to recommend SPE to a new graduate, what would you tell him or her about it?

Aguilera:

I would tell them go become a member of SPE because it is a great society. When you become a member, become an active member. Don't be a passive member. Try to write papers, be a volunteer. It is true that whatever you put in the society, you will get back, multiplied many times more. It has happened to me. I think it happens to everybody. We help. Then, the benefits that we get are much, much more. And, we learn so much while doing all of these things, that it's really worthwhile. I think the students listen to that, and they want to become members of SPE very quickly, early in their lives.

#### **43:42 The Importance of the Oil Industry – Helping the World to Develop**

Smith:

In your opinion, what can we do to attract young people to the industry?

Aguilera:

Right now, it's a complicated situation on that respect. But, the way I see it, and the way I try to do it, is telling them, "Don't forget that about 80% of the energy that we use, comes from the oil and gas industry. When we are flying, when we are driving, we are using products from the oil and gas industry. When we are riding on the roads, asphalt is from the oil industry. The tires, synthetic rubber is from the oil industry. Impermeable roof, the oil industry. Medicines, the oil industry, Cleaning items." The list goes on and on. So,

I think we have to be consistent telling all of these people, all of these young people, that we are doing a great service to humankind providing oil and gas. Of course, we get a rough time in many areas, but it's hypocrisy. I think it's hypocrisy because everybody needs this oil and gas: fly, cars, everything.

So, I try to convince them that way. Then, I tell them, "Listen, the day that the first human being was able to build fire, that day, we started affecting the environment, and anything that we do affects the environment. But, we can produce oil and gas responsibly." That's what we try to do, and that's the best we can do. But, we cannot stop producing it, because people need oil and gas. We need to help the world to develop themselves, and the only way to do that is with energy. And, that energy, right now, comes from oil and gas. We prepared a study where we show many decades of oil and gas, and, of course, eventually, [because] we are very creative, and, eventually, the human being is going to be able to do something which is non-fossil. But, it's going to take several decades. In the meantime, we have to use this [resource] carefully, responsibly, but we have to continue producing oil and gas.

Smith:

What has made working in oil and gas meaningful to you?

Aguilera:

I think pretty much some of these things that I just said. It gives me so much pleasure to be able to say, "Okay, these people in this city today are getting a warm shower, it's not getting cold, because of what we are doing, producing gas. In other countries, the same thing. So, I think it's all of these combinations of things that make it so meaningful. It's a great industry.

Smith:

What advice would you have for today's young leaders in the engineering profession?

Aguilera:

I tell the young leaders, "Keep it up. You are good. Be proud of what you are doing because of the great services that you are providing. Make sure that you always keep up to date in your knowledge. It's very important not to fall behind, and that's something where the SPE is going to help you. All of these meetings, all of these conferences, they are going to help these students. And, young leaders are very important." I think honestly, by looking at my students, that we are in good hands for the future. Sometimes in the past, I wondered about that. But, once I went to the university, I saw these young people, all these young leaders in companies, and so on. I said, "We are in good hands. We don't have any problems for the future. We are creative. We are in great shape with all these youngsters."

Smith:

Is there anything else you'd like to discuss? Got a good story in there somewhere you haven't shared?

Aguilera:

Well, I think I would like to close by saying that this is a great industry. We have to continue working, doing well at what we do. Always keep in mind that we have to do things well, but we have to do them economically, and we have to keep in mind, always, externalities. If we keep economics, externalities together, we help society; we keep the environment as best as we can, then we will be in great shape for

the future.

Smith:

Excellent!