Interview with Engineer Ilya Espino de Marotta, in Charge of the Execution of the Expansion Program of the Panama Canal

The Panama Canal, considered one of the monumental engineering works of the last century, unites the Atlantic and Pacific Oceans and thus saves time, distance, and costs in maritime transport. Panama and the United States of America signed a contract for its construction, and it was inaugurated in 1914. The Panama Canal passed to Panamanian administration in 2000. It remains as it was the first day due to its rigorous maintenance.

The growing demand for canal services and the tendency to build larger ships made the expansion of the canal a reality today. The person in charge of the Execution of the Expansion Program was Engineer Ilya Espino de Marotta, first woman Executive Vice President in this position, who gave us the interview that we present below:

ASPJ-S: I would like to start off by asking you, how did you get to overcome all the challenges that come from being in a very male-dominated field?

Ilya: Actually, I had it very easy. Amazingly, to me gender bias was really a non-issue. When I went to college, we were two girls in ... applied engineering, and I had no problem going through college. When I came to Panama after graduating I started working at the shipyard and it was kind of amusing to the people at the shipyard, like "Oh, look at this girl engineer working here". I had a lot of welcoming feelings, maybe there were one or two people that were a little bit obnoxious, you know, but in general it was all the opposite. I was always very eager to learn, very respectful of the people that were working there before me, so I guess my attitude of "I'm here to learn and I'm not the smartest person in the world" opened a lot of doors. So, in the shipyard I had wonderful support, like I said maybe one or two very isolated incidents, but then I kind of grew my reputation of being a dedicated, accountable, committed employee and I started moving up. Once you make a very good name for yourself professionally, it opens doors. We used to have a little newspaper with all the vacancies in the canal, and I would always apply time and again. I got rejected a few times but once people get to know who you are, then … So, I got promoted by very different offices, I worked at the shipyard for four and a half years, and then I moved to the dredging division, where I worked for like a year and a half. I used to work in the Atlantic side, driving there every day, and as I was getting closer to home I put in for a position in Mechanical Branch. Again I was the only woman in the Mechanical Branch at the time. Now when I go back to the Mechanical Branch, there's like 6 girls, but at that time it was just me. Then I went to work in accounting, which was mainly women and I was the only engineer, I was the evaluation engineer, that was awesome. And then there was a position opening in the Department of Maritime Operations, and I went to work there, and there it was more of a balance, because I was the Capital Program coordinator, so there were women and men. The higher you go the more difficult it becomes, if you're a woman in a man's world. But, through my reputation and my sponsors and mentors, and all my mentors and sponsors have been men, because there were no women opening the way for me. I a my professional background, the fact that I was very good at having a very nice big network, and getting support from many people. Also, people see you like an asset, like wow, she can get things done, she can get people to cooperate, so I think that's when my boss got promoted to administrator (he was my biggest sponsor). He did had a difficult time to get my position ratified by the board of directors. He had to go several times to them, because the question was not if I could do the job or not, it was why her and not a man. And they said well how about this guy and this other guy, and he said why not, and he told me, "I felt kind of awkward, because I didn't want this to be about why they can't do it, just about why you are the best choice", but he went through all that. And from there, with the contractors, with the project, maybe one or two meetings to get to know me and from then on it was smooth sailing. It was

really funny, one time, before I got the job to lead the expansion, there was a Belgiam engineer, really good friend of mine, he liked me, and I liked working together with him for a few years, we were at a conference in Playa Bonita, in the food line and he asked "Ilya, what do you do now that your boss is being promoted? I answered, "Well, I want to run the project", and he goes "Yeah, but you're a woman" and I said "Yeah, so what?" He goes, "You're married" and I said, "My husband supports me", and he goes, "But, you got three kids" and I said, "They're old enough", he goes "You're going to have to do a lot of lobbying", so that tells you that yes, it's not like "of course she can't", it's more like "you're going to have to being doing a lot, because it's a construction world", and to that I answered, "Yeah, so?".

ASPJ-S: What motivated you to get your degree in Maritime Engineering, go to A&M, and become an Aggie?

Ilya: It's was funny, by pure coincidence, I learned to scuba dive when I was 16, and I was crazy about Jacque Cousteau, so I was like "I'm going to be the Jacque Cousteau of Panama". So, I got a scholarship, a Fulbright scholarship, to study Marine Biology in the states, at a small college, called Slippery Rock, in Pennsylvania. The scholarship was supposed to be two years there and then two years at the University of Pennsylvania. After a year and a half, I came to Panama and I started looking for job opportunities where I'd work as a Maritime Engineer, and I'd have to work in a shrimp farm, so I said "No, this is not what I want to do with my life". After a year and a half, I renounced the scholarship and I looked at my Dad and said, "Four years, that's it". I had already done a year and a half in biology, luckily some of the subjects are the same, so I started looking for universities that would offer oceanography or engineering, I wanted to be by the water. A&M was the only one that offered a Maritime Engineering degree without the license option. All the other universities you had to ship out three summers to get the license option, and I wasn't really interested in shipping out, so that's how I ended at Texas A&M. I started one semester of oceanography, came back to Panama and spoke to Dr. Arellano Lennox, who's a Panamanian oceanographer, and he told me that if I ever wanted to work in my field I'd have to be a professor at the University, because there was no other work in Panama for people with my degree. I went back to Galveston and had to take 21 credit hours during my last semester to do the four years on the dot. I got approval from the dean of the school to take them, I promised

my Dad I would do it in four years, and I did it in four years. It was pure coincidence, I just wanted a job by the water, either ships, boats, a shipyard… And then after I started working at the shipyard, I kind of fell in love with the career because it's so great: You sign something in the office and then walk to the shipyard and see how it's being built, it's nice.

ASPJ-S: For a problem as big and all-encompassing as the expansion that you have done over the last few years, how did you tackle that? How did you break it into manageable pieces, how did you look at what phase to do first, or did you do simultaneous phases, what was your approach?

Ilya: We did five years of studies, and once it was approved by a referendum, we had a program management consulting firm from New York, with three or four advisors, that assisted us in analyzing what was the best way to do this. We went through a lot of analysis, with risk assessments, on whether we were going to design and build one contract with everything, or were we going to split it in areas. Because we've been dredging and dry excavating for so many years, we knew how to manage these contracts. We split the dredging in three areas, geographically Atlantic, Pacific, and then the freshwater lake. Traditionally, we've never had contractors in the lakes because we don't want to impact shipping, and we have our own dredging division, so we have our own people to do the freshwater dredging. We put out the bids for the entrances to the oceans. In Cocolí we had to create a brand new six-kilometer access channel, and we split it in four contracts starting at two different ends, so the contractors wouldn't have conflict with each other. Because there was so much dredging to do, we couldn't do it all in-house, so we put out two bids for the lake. It was first time ever and it worked out very nice. And then of course, the locks were one single contract proposal for risk management purposes. Then we did a design and build on all the dry and excavating on the dredging, and a design and build for the locks contract, which was the biggest one, $3.1 Billion dollars.

ASPJ-S: How many countries were involved in all these contracts?

Ilya: There were over 80 nationalities. The consortium that built the locks were from Spain, Italy, Belgium, and Panama. The two dredging firms were from Belgium. For the dry excavation contracts, we had Panama, Costa Rica, Mexico, and Spain. The gates were designed in the Netherlands and built in Italy. The contractor of record was from the USA. We had physical models done in Chile and France. A lot of the control systems were done in Spain. All the valves were designed and fabricated in South Korea. All the steel for rebars came from Mexico. It was a

very international project. When you look at the nationalities we also had Portuguese subcontractors working, so 80 nationalities in total were present here. Very different from the original construction, where we had a lot of foreigners in Panama, and everything was built in Panama. Here, a lot of things were built outside and brought in, 41,000 jobs were generated and over 37,000 were Panamanian nationals.

ASPJ-S: In a project of this magnitude, what would you say were the biggest problems that you encountered and how were you able to overcome them without letting it all ground to a halt?

Ilya: We did have a halt for 2 weeks. But, the fact that we had experience in dredging and excavation made those contracts relatively easy to manage. The biggest challenge was the locks' construction and I would say probably dealing with people from so many different companies was difficult. You had four companies that never worked together before, they had different philosophies, they had an agreement that they all must agree on things to move forward, but not everybody had the same amount of shares. So, you had one company that had 3%, the other 7%, and the other two were the big dogs. And the ones that had the smallest percentages were the ones that had worked with us before many times, but they couldn't influence. They didn't know their clients, and we are very strict when it comes to clients, very regimented, and very enforceable of our contracts. We told them, we don't put things in the contract just for decoration, so if we put it, follow it. We had a labor stoppage in February 2014 and they said if you don't give us an additional $1.2 billion dollars in cost overruns, we'll stop the project. So, they stopped the project for two weeks. That was the biggest challenge, I mean, you had problems everyday but at least the project was progressing. That time was kind of difficult. After the two weeks we had our plan B, we sat down with the contractor and went back to work. And we took about three months to come to a negotiation that would allow us to help them financially to complete the project, with advance payments based on progress, and they were covered with letters of credit to pay us back. I think that was the one of the biggest challenges. The other one was when we did the first testing of the filling of the locks, we had a huge crack on the seals of the lock gates, and everybody said the project was a failure. They had to reinforce six out of the eight seals because they realized they had not put enough steel rebar on the seals to handle the full pressure of full water in one chamber and empty on the other. They thought the seismic criteria was a higher force and they

analyzed it from that sense and underestimated the other. So, that was a second challenge and it delayed the project another four months, but it was on the contractors' money, so there was no issue money wise. Besides those two, dealing with people, with so many different cultures, even internally. We had a program management firm, and of the 32 personnel we started with, we only have 6 people left. You have different cultures, and they thought they were going to run the project, and I was "No, you're coming here to help me run the project". So we had to do some team building… And then in the execution we had the Pacific team and the Atlantic team, and they all have very bright people that want to do things their own way, but this was one single program, so we had to do everything a certain way. I think culturally to get everyone in line was a challenge, so we created this logo "One team, one Mission" and we had to work hard with people. In the end it was a success, but was a lot of work, fun work, and I learned quite a bit, everybody learned a lot.

ASPJ-S: Now that you have completed the project, and everything is working perfectly, how do you maintain the proficiency of the team?

Ilya: What we did, once we finished the project, was hand to it over to operations. However, in the contract, the contractor is on site, still with us, for three years for maintenance, so they're training the local workforce and eventually after three years we will decide "Do we want to do the maintenance ourselves or do we want to rehire these guys?". Also, as part of the contract they must give us training on all the systems they designed. Right now, if you go to the locks, everyone that operates the locks is a Panamanian employee, and everyone that is working on the maintenance of the locks is a contractor. As a matter of fact, this month we start the transition period, because next year we'll decide what to do. I think they have about 100 people on board, and we have around 20, because we still need to interact with them as far as maintenance goes. The operations people are the ones that are running it, I have nothing to do with the project anymore, except for minor defects the punch list, the maintenance contract, and claims of course.

ASPJ-S: With the amount of high value targets that pass through the Canal, whether high monetary value or military, what type of security do you operate? Do you have your own security force, or do you coordinate with the National Air and Naval Service of Panama (SENAN)?

Ilya: We have our own security, but in tight coordination with the government, SENAN included. We do have joint force exercises once or twice a year, we used to have a U.S. Coast Guard person on board until about 8-10 years ago, the U.S. Embassy provides intelligence sharing and advice. We have a Response Center and cameras all over the Canal and patrolling on the water.

ASPJ-S: With around 14,000 vessels traveling the Canal per year, do you imagine this is most of the income for the Panamanian government?

Ilya: Not the majority, I think we're probably 3% of the treasury. The big thing about the Panama Canal is that it's all money coming from the outside, it's not money that's moving within the Panamanian economy, it's always fresh money coming from outside. It's an injection to the economy, and then of course, you have 10,000 employees which bring in about 60 million dollars, which is also money that helps the economy, buying cars and houses, and schools, and all that. Everybody must pay cash, and ahead, we don't give any credit. So, at the end of the year, we give a certain amount of the tolls, a monthly rate, to the government, $1.65 billion dollars last year, which has been the highest. In 18 years of operation under the Panamanian government, I think we've given $14 billion dollars to the country. I think we have an impact of like 36% of the economy, as far as the logistics that we bring together, with the ports, and the railroad, and because a lot of the ships don't do just transits, but also transshipments.

ASPJS-S: So, now what, now that you have accomplished this, what's next, what's the future?

Ilya: Whatever the future brings. I don't know, I don't have any specific plans, my boss is retiring in August of next year, so I could become administrator, that would be a promotion. The Deputy Administrator will be leaving within one or two years too, so I could become the Deputy Administrator, that would also be a promotion for me. Right now, I'm still working in engineering, we're building a bridge on the Atlantic side, about 80% completed, a $570 million-dollar project. We're going to put out to bid a new spillway on the Atlantic side, because the original spillway, with today's standards, is not suitable enough for the maximum probable flood. We're adding a new spillway with 14 gates, so we'll put that out to bid sometime in October, a $300-$400 million-dollar project. We're building a new bridge in Gamboa, because right now there's only a one lane bridge, and we're turning it into a two-lane bridge, that's about a $90 million-dollar project. I could retire in August of next year, that's an option too. I couldn't stop working, l still got more to give. But, my husband is American and he's dying to go back to the States, so I could retire and go work in the states.

ASPJ-S: Thank you very much, you have a great way of explaining Maritime Engineering to the layman.

Information and photos: Panama Canal Administration.

Ilya Espino de Marotta, studied at the University of Texas A & M in Galveston, Texas, United States, where she received a degree in Marine Engineering. She obtained her Master's Degree in Economic Engineering from the Santa María la Antigua University in the Republic of Panama. She took management development courses at the INCAE business school in Managua, Nicaragua and at The Kellogg School of Management in Illinois, United States.

She has worked in the Panama Canal Commission/Panama Canal Authority for more than 30 years and has held several positions. She currently serves as executive vice president of Engineering and Program Management, in charge of preparing the designs and specifications of all Canal projects, and the awarding and administration of all construction contracts for the Panama Canal. She was in charge of the execution of the Panama Canal Expansion Program.