Patriot Pipeline Safety: One Man's Vision for Pipeline Safety Training Excellence

Justin Maloney, founder of Patriot Pipeline Safety

Justin, give us a quick rundown on how you got into the pipeline industry, your pathway to where you are right now.

Sure. I started with ONEOK Partners which is based out of Tulsa, Oklahoma and I started at the bottom level in an Associate position. My job was general maintenance of the pipeline compressors and valves and the operations and maintenance of a 30-inch natural gas pipeline that ran 365 miles. I was in charge of about 16 miles of that 365 miles and was involved in two mentor-mentee programs that ONEOK offered. One of them was with a gentleman named Leonard Todd who was an old director from Enron, and another one was with a gentleman named Lester Burt, an operations technician and pipeline operator for 38 years. Both these mentor-mentee relationships had a profound influence on my career.

Lester taught me a lot of the field aspects of how to operate and maintain a pipeline: how to work on the compressors and tear apart valves and understand how gas flows through the line. Leonard taught me a lot about the business aspects: business etiquette in regards to understanding personalities, understanding body language and communication. He taught me how to be an eloquent and elegant professional. So, it was a very good mix of education for me at such an early age.

> "What you learn on these pipeline right-of-ways, it's so valuable, because it's not something you can go to school for and learn it in its entirety. You're compensated financially, but you sacrifice a lot personally. So it is a give and take." *-J. Maloney*

So how old were you when you started with ONEOK?

I was 22 years old when I started there. I spent the first half of my career working on very large compressors and Solar turbines. I also worked on valves and did other operational things such as running PIGS, which are called pipeline integrity gauges. They inspect the inside of the pipeline. Then I slowly moved up the ladder to Multi-Skilled Technician and eventually Crew Leader. My introduction into the construction part of the industry came when ONEOK utilized a company called Minnesota Limited to do all their construction in their station. So I was always working alongside these pipeliners in the field when they would do modifications to some of our stations. My working relationship with them grew stronger and stronger over the years.

In my mid 20s I started a family, and at about the same time my daughter was born, Minnesota Limited called me and asked me if I wanted a job in the Bakken Shale and the Bakken oil fields of North Dakota. And I accepted it. That's when I started work on a main line spread, and I met another two gentlemen that became very important mentors. One was Mike Buric, who is now a general superintendent for Minnesota Limited. And the other one is a friend, James Redmond, who is now a superintendent for Minnesota Limited.

What year did you start with Minnesota Limited? What experience did you gain there?

I started in 2012. Mike and James started breaking down the fundamentals of the assembly line process to build a pipeline. And I started picking up the different disciplines that it took to construct a mainline pipeline. And along with that, I picked up experience in the maintenance of these mainlines that ran operations. So I got a very good background with the construction part of things, and that's always a continuous improvement in one's career. I don't think that you should retire knowing everything. I think that it takes continuous discipline to teach yourself more about the industry, because materials change, practices change, equipment changes, standards change, client requirements change and environmental regulations change. You're always evolving as a pipeliner.

As part of my tool belt now, I had gained experience in pipeline operations and pipeline maintenance, and then I started to further my career in pipeline construction. From there my career just started to progress into the quality and safety of pipelines under construction, and that developed into further relationships with Precision Pipeline, with Enbridge. When I started with Enbridge in 2013, that's also when I started Patriot Pipeline Safety.

So explain how that worked. You were working full time with Enbridge, but you personally created Patriot as a side venture?

Yes, I wanted to address multiple things that were affecting the safety and quality of pipeline construction that were not being addressed and still to this day are not. I wanted to fill the training gap for new professionals in this industry. In the mid 80s when work was slow, not a lot of new people were coming into pipeline construction. As a result, we are now suffering the consequences, as the baby boomers continue to retire. We don't have the time, nor did we have the time, to fill those shoes–to help new workers entering the industry quickly gain the experience that these older pipeliners had gained over so many years.

And this has occurred at a time when work is extremely busy, experience is extremely hard to come by, and curriculum that solely concentrates on pipeline construction, lacks in detail. So I wanted to provide an answer for a younger pipeliner and say, "Here. You can take this training and this is going to deal with exactly what you are going to look at on a pipeline right-of-way under construction." And that was the creation of Pipeline Construction 101 in 2013.

And that was part of your company, Patriot Pipeline Safety, correct?

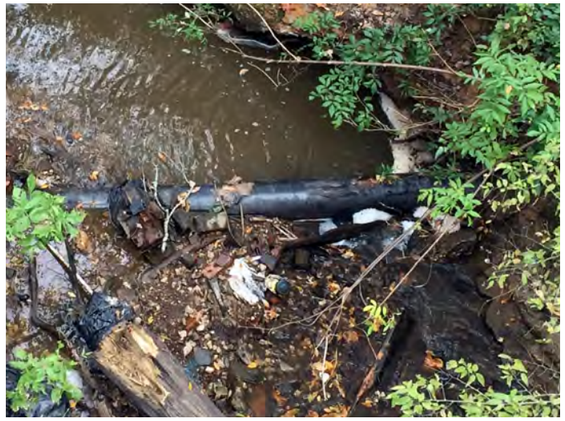
Yes it was.

So was there one specific incident or accident that happened that just made this click where you thought, yes, there is a need, there's an absolute need that's not being met in the industry right now, and I'm going to fill it. Or was it just noticing in general these gaps in knowledge, gaps in training, that made you want create something like Patriot Pipeline?

It was a general lack of knowledge, in training, for green hands new to the pipeline construction industry. These young women and men are being hired by these pipeline contractors, and the only training that they have much of the time is a simple 30 minute to one hour orientation by the contractor. Then they're thrown onto this busy right-of-way with thousands of pounds of moving equipment and a thousand different hazards that nobody has told them about. So Pipeline Construction 101 was designed to offer a free tool to understand the industry better, before or once they got there. The course will help them understand better what they are working around.

Explain what else Patriot does and how it's evolved over the years.

So I started to design and build custom damage prevention plans for contractors in the United States to train their foremen during form and competency training and to train all new employees that were coming on to their projects. These damage prevention programs dealt with exactly what they were going to be working around: how to avoid line contacts, how to recognize the landscape for foreign and unknown utilities, how to understand different types of sweeps with locating equipment, the process of the one-call and how important it is to have the information onsite, and then how do we convey all this to new employees?



Picture from a ground patrol carried out in east Texas. While assessing the right-of-way for this 10" pipe, heavy debris were discovered that caused coating damage. This was a result of heavy rains washing the debris off creek banks and coming into contact with the exposed pipeline. The erosion happened in a densely wooded area near a single lane bridge. It's another type of environment aerial surveys cannot see.

And that's where you capitalize on the importance of the discussions that take place in the JSAs - the Job Safety Analyses. I gave them that training, and then I also started to build comprehensive quizzes on the knowledge. So it became a source of information for them for the industry, but it also held them accountable for understanding how important it was. These tests were required as part of the competency training for the foremen. And sometimes, depending on how the contractor wanted to use them, they were required for new employees.

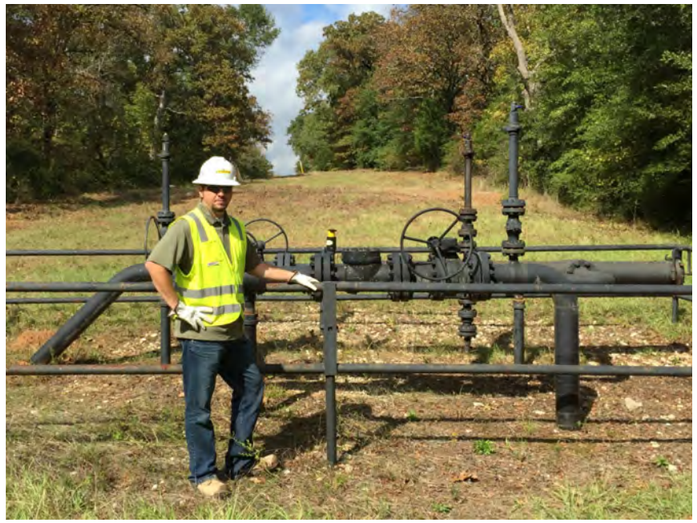
I have also done some technical advising for a couple legal firms on pipeline construction accidents: the pros and cons, the facts of how the equipment is used, why it's used, and the safe or unsafe ways to use it. My strongest suit is field consulting. I work with pipeline contractors and all of their foremen and employees, and I work with an open door and an open book. So when I go out there, I'm not very authoritative. I'll take new employees and foremen and say, "Have you considered this in your plan today? Keep in mind as you dig through this trench, this is going to widen with the sand putting the pipe closer to the trench. Let's make sure nobody stands between the trench and the pipe. Watch your radiuses with your track hoe because of this activity coming up." So I get into the real technical aspects of pipeline construction as well as the safety and quality factors that go with those details that are that are so little spoken about.

Talk to us a bit about the pipeline industry in general. What are some of the biggest issues that are facing the industry today?

I think the largest threat to America's pipeline infrastructure is terrorism. I think that it's tremendously overlooked and little understood. I think that there's room for improvement to recognize the vulnerable areas in our operating pipeline infrastructure in the United States today.

Is this something you've heard from law enforcement groups? How exactly are we exposed?

There is room for improvement to build the relationships between pipeline operators and organizations like the Transportation Security Administration. There is a lot of room for oil and gas companies that operate these pipelines to improve on ground surveillance, to get an in depth look of not only the quality condition of their assets, but to conduct detailed security assessments while carrying out those quality and safety inspections.



Here was a pipeline patrol Patriot Pipeline conducted on a gathering system in east Texas. They developed a comprehensive report to identify security vulnerabilities, corrosion detail, quality assessments, and CFR compliance assessments.

So there's opportunity for training pipeline operators to understand these vulnerabilities and to be able to recognize them while they're maintaining and operating pipelines. And that's for the operations sector. There's a tremendous amount of room in the construction arena to understand forms of eco-terrorism, vandalism and trespassing by protestors, and that goes into understanding how to secure a site. It goes into understanding who are your most vulnerable crews. You have to understand that the opposing party that is against your overall goals of building that asset may have advanced resources.

So how do you understand where your most vulnerable areas are? How do you plan for that in advance? In doing so you're protecting the integrity of your company's name, and you're sustaining those valuable relationships with your communities that these assets serve. And you're also securing the good name and relationship of the client that you're working for and your own company. We as an industry, both in operations and construction, are just now starting to address this, though more reactively than proactively.

So you're saying we should be more proactive with things like ground patrols. Are people relying too much on drones and unmanned aerial reconnaissance?

I think that we suffer from not allowing room in our fiscal budgets to accommodate detailed, effective ground patrols. The FAA has certain rules that make the use of drones impossible with pipelines. You can only cover so much ground, it has to be done with multiple people, or you can't fly them over people under certain areas the pipelines run through. The pipelines can't be close to an airport or be in a shared corridor with electrical transmission lines or also own electric in the same right of way. That knocks drones out of the picture. So boots on the ground is the best pipeline assessment for security, surveillance, safety and quality, and there is room to improve on that in this country.

Going back to terrorism, is the bigger issue more homegrown terrorism? Or are we talking more about foreign terrorism, countries that are trying to kill Americans and do damage to our infrastructure?

I think it's both, because a lot of these pipelines are operated by SCADA systems–Supervisory Control and Data Acquisition systems–and those can be hacked into from anywhere. How you operate a pipeline is very similar to how you would operate a pipeline in a foreign country. So the threat could be foreign or domestic to these forms of infrastructure. But it's understanding the vulnerabilities that might have a domino effect.

If you hit a certain mainline valve, if you understood where you could do the most damage because you understand how a pipeline operates, you're not only talking about risking the integrity and safety of the pipeline in operation. You're talking about shaking societal stability if you interrupt a crucial resource that's needed at a certain time of the year. Also, the location of where you interrupt service can impact refineries, bridging or other forms of critical infrastructure such as runways or railroads. It's in putting these pieces together that there's room for improvement. In every system in this country it's different, but you can only put those pieces together if you get out and look at your system.

I think the second most important case for ground patrols is in helping you

address real time conditions of your utilities. A big danger we have to our nation's infrastructure is the integrity of it. Much of it is crumbling. We don't know how much, and we don't know exactly where, for multiple reasons that so many companies face. And it's not their fault, we're not blaming them. But when you deal with things such as buying assets, you're buying a bulk of assets.

Sometimes companies don't know everything that they have purchased. You have retired pipeline operators and retired pipeline owners that had records that went with them during retirement. You have infrastructure installed that was never mapped, or it was improperly mapped at the time. You have internal breaks in communications between departments that result in a lack of information to properly assess utilities. So you may only be given 65 percent of what actually needs to be looked at and maintained, because the information just doesn't exist. It's such an old utility, or Bob retired 12 years ago and he was the only one that knew about these 14 miles. Or some of them were never installed with any tracer wire, and they may be in a shared corridor, which then interferes with the frequency and accuracy of your locate because of the way technology uses electric current.

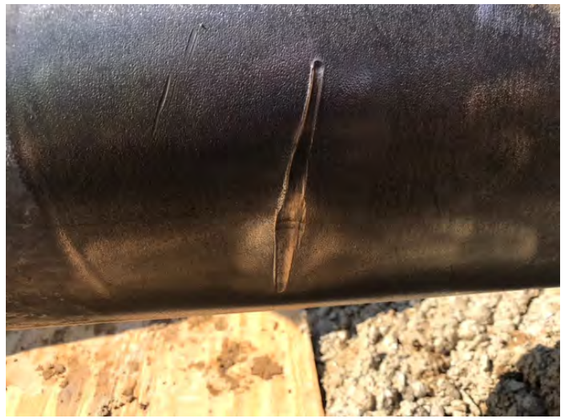
All these factors play into the integrity of our nation's infrastructure. Environmental damages, shallow pipe, things of that nature–so much of it is preventable if we just walk these right-of-ways more often with trained personnel. Then they can point out, there's a shallow pipe here, an exposed pipe in this creek bed, vandalism at this meter station, and so on.

What are your thoughts on mapping when you're working on these projects? Do you feel it should be more readily available, or does that go back to concerns over terrorism?

I don't think there should be a national pipeline mapping system. I don't see the benefit, because when you're working around them, only the company has resources available to share with you and that you can directly ask for. I don't see the benefit in offering a tool to somebody with malicious intent that may know how to operate or understand the fundamentals of the specialized equipment such as mainline valves, laterals and heaters. There's enough markers to understand generally where most utilities are, and then there's enough contact information for somebody to get more details. Why throw another tool out there to add to the vulnerabilities that already exist with the SCADA systems used to operate these pipelines.

Are we going to see a busy next couple of years or even decade or so of pipeline construction and maintenance with an increase in business activity? Is it just going to become more and more difficult to keep pipelines secure?

Yes, it is going to grow in difficulty to keep these forms of infrastructure secure. I think that construction is approaching what this country needs in regards to oil and gas as a resource. However, there's still going to be a sustainable amount of construction work in the maintenance area to upgrade



This scratch was discovered during an excavation on an existing 12" natural gas line. The pipeline was excavated where the scratch was discovered and reported to the owning client. It is unknown when the scratch occurred or how. It is suspected that the damage came from a tiger tooth on a bucket or an improperly installed flat bar welded on teeth. Area work was halted and repairs were scheduled immediately. Unknown metal loss amount. Unknown remaining wall thickness.

and maintain what already exists. But so many big projects have taken place in the last five years. It's really pulled from the available resources in the Bakken Shale, the Marcellus Shale and the Eagle Ford Shale. We've answered the call for more infrastructure in this country, but we still need to do a lot of work in maintaining what we already have in service.

What percentage of pipelines are above ground versus below ground, and what are the challenges? You've mentioned underground pipelines can become exposed due to soil erosion, but some of the pipelines are above ground as well.

I'd say maybe three to six percent of our nation's pipeline infrastructure is above ground. All you have above ground are your mainline valves, your meter stations, your launchers and receivers and your lateral intersect points. The rest of it's all below ground. Standards have changed over the years. Yesterday's pipelines had to be installed at shallower depths. And that is because of lack of regulation when they were installed, and available equipment in that day and age. Some of these pipelines that were installed three to four feet deep–when you add on 40 years of weather, rain, flooding, erosion, storms, winter freeze and thaw–not only does erosion occur, but things that are in the ground start to damage the pipes. Quality standards were all so different in the past.

Today we have to backfill with severe limitations. There's no rocks allowed much of the time. There has to be a solid bedding for the trench, and then the backfill has to be a foot and a half to two feet of nothing but fine grade material to surround that pipe and protect the very valuable coating. In the past, if you dug rock out of the ground, that's what you'd backfill with. So as the freeze and thaw cycles occur in this country, especially in the North and Midwest, these rocks and debris and garbage move underground. Pressures are created that push these debris and rocks against the pipe, causing anomalies.

So that's one reason for the increase of anomaly digs in this country, and it's a good thing to be taking care of it. The coating was different back then. So as things are exposed to water, rain and other external factors with weather, coating deteriorates and rust occurs. If the pipelines are not maintained through a good integrity program that oil and gas companies should have, they will start to decompose naturally. That's corrosion, and many companies don't have a very proactive quality control program. So your infrastructure starts to rust, and without inspecting it, you don't know that. In the way it's designed, some of it may not be detectable externally, and so you can't pick up on the internal damage, and then it ruptures.

Does anyone have any estimate or even a ballpark guess at the percentage of these pipelines that are deteriorating and that need to be replaced?

Yes, I would probably look at INGAA for that, the International Natural Gas Association of America. And I would look at AGA, American Gas Association. And maybe even the CGA would have some statistics.

What about PHMSA? What do you see as their role in all of this, and do you work directly with them? Talk to us a little bit about federal oversight when it comes to pipeline safety and pipeline integrity.

Sure. I do cross paths with them a lot on many projects and begin to get a better scope of my audience that I deal with. Whenever anything is government or public like that, all the information for the higher requirements is also public. PHMSA's biggest requirement to be a pipeline inspector is you have to have an engineering degree–usually structural or civil. An engineering degree is a great asset to have in this industry, but without working field knowledge you really are not making a full assessment. You might be given a checklist by PHMSA, and because you have a degree you go out there, and you're able to identify some really obvious hazards or vulnerabilities. But unless you have served time working on pipelines, building them, understanding them, you might be seeing 20 percent of what's actually in front of you.

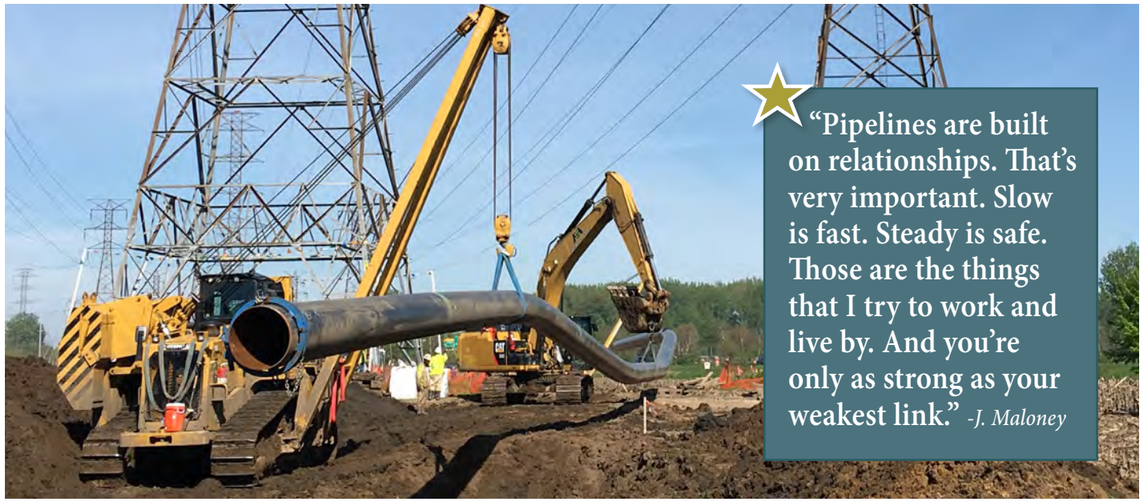
So I think the technical requirements to work for PHMSA could be improved, and then validation of those years of service in the pipeline industry. To become a pipeline inspector for PHMSA, all you need is a civil engineering degree. Of course, increased hiring of inspectors looks good to the public because, "Hey, the government hired more people to watch the safety and integrity of the pipeline both in operation and construction." Yes, but they hired the cheapest guy out there. That cheapest guy is a kid right out of college with his civil engineering degree who has never seen pipes get put in the ground.

You talked earlier about the generational differences and the baby boomers retiring. We've seen this a lot in the locating industry with trouble hiring younger people who just don't want to do this sort of work. We assume that you have similar problems in the pipeline industry? How do you attract younger people to the business?

I think very recently it's come to light that the younger generation is dissatisfied with what they were told about what they were going to get out of life with a college degree. And this has also occurred with a lack of accountability for people's actions. That affects work ethic quality. So we do struggle within the industry in trying to find reliable, dependable people who want to learn, because it's not easy to work outside in the elements all day, to go home dirty every day. But you make a really good living doing it. We're losing that grit, that integrity in America's young workers to withstand that type of work throughout the day and to have the desire to do it in the first place. And when you do find them, you've got to hold on to them. In general, we have more success with young men and women that grew up on farms or that were involved in sports teams, than we do with people from more populated areas. The kid that grew up playing in the woods in upper Michigan is going to be more durable on a construction site because he or she is used to that environment.

We had some workers recently that were new to the industry that did show up on time, that did come to work, and they were interested when the weather was nice. But as soon as it rained--no lightning, no thunder, just a spring rain, they refused to work. But you know, it is a reward. It's a sacrifice, but it's a financial reward. And you're also learning a skill that is not taught

A 30" being installed in a highly congested area. The concrete casing and foreign utility were never located previously. This is why a second locate 3rd party practice is so important.



Advising best practices for construction in shared corridors with clients who operate both electric and gas in the same right-of-way.

in its entirety in any university or trade school. What you learn on these pipeline right-of-ways, it's so valuable, because it's not something you can go to school for and learn it in its entirety. You're compensated financially, but you sacrifice a lot personally. So it is a give and take.

Aside from the work itself which can be considered difficult or physically demanding, how do you deal with the bad perception that follows the pipeline industry in the media? How do you combat bad feelings that people have about the pipeline industry in general?

I'm really glad you asked that question. I think it's a question that should be asked more often. Our railways, roads, airlines, waterways–these have all been built in large part by American hands, American engineering and American strength. We'll build anything you want. We didn't make the decision to create a society solely dependent on oil and gas. We're simply constructing what the demand is out there. If you want to go solar, we'll build you solar fields. If you wanted to go strictly natural gas because of the emissions, we'll continue to build pipelines, but just natural gas ones. We didn't create the demand, although we do contribute to it like 99 percent of Americans in this country.

I can speak for the entire industry with several conversations under my belt and pilot projects under my belt from protests. I wish people would educate themselves more on what they're protesting before they come out and vandalize the equipment, try to physically harm workers, try to deteriorate the integrity of the company doing the construction. If they did, they would realize everything that they're involved with in their lives is touched by oil or gas. And it makes them look really foolish when they're protesting you with shoes on their feet. They drove a combustion engine to the protests, there's tires on that vehicle, there's buttons on their shirt, there's the markers they used to write those profanity filled signs. They all took petroleum to make. Without that this country stops moving. And until we together as a society make the conscious decision to move forward for a cleaner environment with everybody on board, the workers in this country are going to construct with the demand is.

What are your current goals for Patriot, and where would you like to see your company be in the next 5 to 10 years?

First and foremost, I would like to see more collaborative efforts between Patriot Pipeline and oil and gas companies to improve ground patrols and to improve pipeline security and surveillance efforts across the nation's pipeline critical infrastructure. I still also want to be heavily engaged in field consulting on pipeline construction projects. I think that we've made tremendous headway in training tomorrow's generation pipeliner to better recognize the hazards associated with today's industry and constructing pipelines. I want to continue that movement, continue that momentum. As for myself, I just want to do whatever I can while I am still young enough in this industry to leave it better than when I found it. That's why everything is free that I try to do. I have thousands invested in this curriculum that I give away at no cost. I just want to say, here this can help you. I've lived it, I've been through this thing and know what you're going through, and I was in your shoes once. I wish this existed when I was your age. Here it is. If you want it, it's free. It's here to help you.

As we wrap things up, is there anything else you wanted our readers to know?

Pipelines are built on relationships. That's very important. Slow is fast. Steady is safe. Those are the things that I try to work and live by. And you're only as strong as your weakest link.

Visit www.patriotpipelinesafety.com for more information about Patriot Pipeline Safety.