UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

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Investigation of: *
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MERRIMACK VALLEY RESIDENTIAL GAS *
FIRES AND EXPLOSIONS * Accident No.: PLD18MR003
SEPTEMBER 13, 2018 *
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Interview of: KEVIN SWIGER

Columbia Gas of Ohio
Gahanna, Ohio

Thursday,
March 7, 2019

APPEARANCES:

MICHAEL HOEPF, Ph.D., Human Performance Investigator
National Transportation Safety Board

ANNE GARCIA, Human Performance Investigator
National Transportation Safety Board

ROGER EVANS, Investigator in Charge
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THOMAS TOBIN, Esq.
Wilson Elser Law Firm
(On behalf of Mr. Swiger)

I N D E X

I N T E R V I E W

DR. HOEPF: My name is Mike Hoepf. Today is March 7th, 2019, and we are at 1600 Eastgate Parkway, Gahanna, Ohio. Kevin Swiger, is in connection -- sorry -- interviewing Kevin Swiger in connection with an accident that occurred at Merrimack Valley on September 13th, 2018. The NTSB accident number is PLD18MR003.

The purpose of the investigation is to increase safety, not to assign fault, blame or liability. NTSB cannot offer any kind of guarantee of confidentiality or immunity from legal or certificate actions. A transcript or a summary of the interview will go in the public docket.

The interviewee can have one representative of the interviewee's choice.

Kevin, do you understand that this interview is being recorded?

MR. SWIGER: Yes.

DR. HOEPF: And could you please state and spell your name? And I'd like everyone else in the room to do the same.

MR. SWIGER: Kevin Swiger, K-e-v-i-n, S-w-i-g-e-r.

DR. HOEPF: Okay. And I am Mike Hoepf, H-o-e-p-f, with the NTSB.

MS. GARCIA: Anne Garcia, G-a-r-c-i-a, investigator with the NTSB.

DR. JENNER: Stephen Jenner, S-t-e-p-h-e-n, J-e-n-n-e-r, investigator with the NTSB.

MR. TOBIN: My name is Tom Tobin, T-o-b-i-n, and I'm a partner with the Wilson Elser law firm.

MR. SWIGER: And I believe I missed part of my cue. I'm director of engineering for NiSource. Kevin Swiger.

DR. HOEPF: Thank you.

MR. EVANS: And this is Roger Evans on the phone, R-o-g-e-r, E-v-a-n-s, NTSB, IIC.

INTERVIEW OF KEVIN SWIGER

BY DR. HOEPF:

Q. Okay. Do you mind if we call you Kevin?

A. Kevin is fine.

Q. Okay. Thanks. Okay. Can you just start with telling us a little bit about yourself, your background?

A. Okay. Probably the easiest way to understand my background is to think of it in three different categories: First, from an education and certification standpoint, and then my career at NiSource, and then my external involvement with associations and things. So let me step through those three pieces.

I am a civil engineer graduate from Ohio State in '82, received my, earned my PE in 1992 here in Ohio. I'm a registered professional engineer since '92. And I completed my MBA in 1995. So from an education and sort of credential standpoint, that gives you that perspective.

I've been with NiSource for almost 37 years. I've been in a dozen or so roles with NiSource across all seven states and

physically lived in five different locations. So I've got a fairly broad perspective geographically with NiSource and duration, as well.

In those 12 roles, I started as an engineer. It was called something different but similar to the field engineer role we have now in Virginia. And over those years, I advanced through operational roles. My career's probably evenly spread between operations, engineering, and then corporate role. As I said, I started as an engineer, moved into area operations.

And at IRA, I was an area manager, where almost every geography was a stand-alone utility, almost autonomous. Was an area manager in Virginia, as well. Went back in engineering for a while at the supervisor level, then into operation with day-to-day plant oversight for maintenance activities, construction activities in an area. And then moved into more of a corporate environment with the rollout of our different operations supporting technologies, our work management system, our GIS system. I led the development, testing, deployment and support of some of those tools in the '90s, and then moved back into field operations over system operations, which is near and dear to some of these things. System operations is the area that oversees measurement, regulation, leakage inspection, cathodic protection. And I also had environmental health and safety.

Following that, came back into the role of compliance oversight and technology support. I won't go into all of the

specifics there, but that started my more current role of covering all the states. And now, since 2012, went back into more pure engineering and have been overseeing the gas engineering across all seven states for the last 7 years or so.

The last segment, my external involvement, been heavily involved with, first, the Ohio Gas Association at committee level, and then ended up on the board, and eventually worked through the chairs and chaired the Ohio Gas Association. I also, overlapping -- it got to be busy there for about a half a decade -- for the last 20 years I've been on the AGA engineering committee, and also went through the chairs and chaired the American Gas Association engineering committee. And I'm still active on the engineering committee.

On top of that, AGA has another group called the Best Practices Organization that takes on different activities and benchmarks, not only from a statistical but from a process and -- I'm not sure if you're familiar with it, but I've been involved with that program since the '90s and actually spent the last 10 years on the steering committee for the AGA Best Practices benchmarking effort.

So, between education, NiSource and Columbia experience, and then that external involvement, I've got a pretty broad background in not only engineering but overall operations in the gas utility.

Q. Okay. Thank you. Thank you for the good background there. Okay. So, who reports to you?

A. The direct reports are the engineering managers that span the seven states. And there's really two categories. There are the, what I refer to as specialty engineering, where we've got the standards group. It's probably easy to recognize as a specialty group. There's a team that manage not only the standards but the process by which we gather information and build those standards. We also have a specialty team, gas system planning, that does our system modeling and long-term planning. And then a design engineering group that does our specialty designs: transmission class pipelines, major points of delivery from transmission companies, the big stuff.

Parallel with that and, actually, the majority of the team that reports to me are the field engineering teams. And they're organized around their state jurisdictions. So there is a field engineering manager for Ohio, there's one for Indiana, there's one for Kentucky, one for PA and Maryland together, one for Virginia, and then one for Massachusetts. And reporting to those field engineering managers are the leaders and the actual field engineers in each of those jurisdictions.

You know, as an example, you know, I think you might have met -- I'm not sure if you have or not -- Dave Mueller. The name's probably familiar. He's in Massachusetts and he reports to me. And he has, you know, five counterparts across the other states that report to me, as well as the managers of those specialty groups that I mentioned: the design, gas system

planning and standards teams.
Q. Okay. Great. And who do you report to?
A. I report to the senior VP, Chuck Shafer, who has not only engineering but construction and several other groups reporting to him.
Q. Okay.
A. The compliance group. Jim Roberts you met yesterday, I believe, is on Chuck's staff, as well.
Q. Okay. Okay. And so, in terms of your position, how many -- are you the only director of engineering or are there other directors of engineering?
A. There is -- on the gas -- separating the electric from gas, I don't have any involvement, or limited involvement with the electric side.
Q. Okay.
A. I'm the director of engineering for gas engineering. There's one other somewhat related, director of transmission integrity.
Q. Okay.
A. But they're really focused on temp and not on overall gas engineering. And it's a small specialty group, you know, a dozen or so people that do just transmission engineering. But outside of that specialty group, I have all engineering, nearly 300, a team of nearly 300 across the seven states.
Q. Oh wow. Okay, okay. So, as far as director of engineering, and then across your seven states, each one's got a manager of the

field engineering?
A. Correct.
Q. Okay. And that's a big core component of who's reporting to you and --
A. It's 80 percent or so of that 300.
Q. Okay. Okay.
A. That are in the field engineering. They're really the frontline engineering. And the specialty groups you can almost think of as, you know, internal consulting teams that are brought to bear on special type projects.
Q. Okay, okay. That's helpful. So you've given us a pretty good background about yourself, so, you know, you don't need to repeat yourself. But anything you haven't already commented on, what safety training have you received?
A. Over 37 years, I'm not sure if I could even go back and print it all out. But, I mean, ranging from personal safety and certainly all of those kind of things, OSHA-related type safety to as important, probably, from this perspective, is, you know, pipeline safety. You know, a lot of experience and training over the years in different facets of what 192 means and best practices, as I mentioned earlier. So, you know, I think training shows up a lot of different ways in a lot of those kind of benchmarking studies or discussions and engineering committee meetings on how people handle different situations.
So, combination of 30-plus years of modules throughout that

time frame and a lot of interactions and just a lot of frontline experience, as well.

Q. Yeah. Okay. And how about, I mean, do you have any, you know, what you might call systems safety training, you know, kind of focused on risk management sort of stuff? Like, do you go to conferences and that sort of thing or --

A. One of the things that pops to mind when you ask about that, to give you an example, is some of the tools that we use. You know, the Optimain tool -- one of the reasons our engineering group is as large as it is, is our focus around infrastructure modernization, replacing what we refer to as priority pipe, which is cast iron and bare steel, you know, legacy pipe.

And to accomplish that, you really need to decide -- because there's plenty to choose from, so you've got to decide which makes sense to go after first. And we use a tool called Optimain that we put in place 10-plus years ago to help us analyze that risk. But I see that as a decision support tool. It doesn't spit out an absolute answer. But in order to operate that, you have to understand what variables are going into it.

And before we -- trying to trace the legacy back a little further, before that, commercial software was available to do risk analysis, we were doing that with our own spreadsheets. We had created things locally that, you know, every row was a section of pipeline and the columns were different attributes of that pipe, the history of the pipe, the environmental conditions of that

pipe, all being factors that go into the decision of whether -- how risky that is compared to other sections of pipe, the relative risk.

So just day to day, part of our engineering function is to make that kind of analysis. And we've expanded that over time. You know, to talk about, you know, measurement stations, regulation stations, what's the attributes, what's the risk level compared to, you know, other stations and where should our focus be in trying to improve our system.

Q. So, not to bounce around, but while we're kind of talking about the Optimain, you know, system, so my understanding of that is that, you know, Optimain would be useful to say -- to help you understand, okay, you know, this is a piece of pipe that is -- you know, has these properties, it's located under a hospital or a school, and it's a high risk.

A. I hope to god not under, but yes.

Q. Well, yeah. Right. You know what I mean, yeah. Yeah, something that, you know, it's --

A. It's in an urban area versus a rural area.

Q. Yeah. Yeah. So you would say, okay, you know, engineering needs to prioritize replacing, you know, updating this piece of pipe. Is that kind of a primary function of Optimain?

A. Correct. Go ahead. I didn't know if you had a --

Q. No, no, I'm just trying to kind of clarify, you know. Well, first of all, is my understanding kind of correct that that's the

main focus of Optimain, or are there other areas too?
A. It's the main focus. As I just said and I saw you make a note, it's a decision support tool. It doesn't spit out a magic answer. It gives you a list of candidates. We then supplement that information with local knowledge. You know, we'll meet with local operators.
Q. Right.
A. For things that might not have, you know, revealed themselves in the databases.
Q. Right.
A. You know, the data, I mentioned earlier I was part of developing and rolling out our work management system and our GIS system. Those certainly are major collectors of data about those facilities, but it's not all-knowing.
Q. Right.
A. So, we take those initial results in sort of an annual cycle, and then we update it throughout the year, as well, with new information. But we'll visit, we'll have meetings with the local operators, the local system operations personnel or the local field operations personnel that are the ones out there operating and maintaining those lines to see if there's any other factors that they're aware of.

We also blend in our knowledge of what municipalities are doing: Is there any significant work going on in this area of town where they're going to replace the street, replace the sewers

that might create additional risk, or opportunity? Because if they're going to tear the street up, you know, to do something else, what a great time for us to replace our gas facilities at the same time. So, you know, to the them of this around risk analysis, I see all of those factors being, you know, an engineering function to reach out and pull all that together to really formulate a plan around where we can best, you know, improve our infrastructure.

Q. Yeah. That makes sense, makes sense. A lot of factors go into it. You know, how about, you know, are there other tools in terms of, you know, how you go about approaching managing risk and just, you know, let's say construction or something like that? You know, making sure that the work project goes off as it's supposed to. You know, making sure that, you know, you've got the right people qualified and in place, managing your contractors to make sure they're qualified. You know, can you talk a little bit about the sort of assurances that you use to make sure that, you know, these work projects are properly designed and they're executed properly?

A. Yeah, some of the areas you mentioned, you know, more so than others. As you pointed out earlier, some I'm not as deep, and we started talking about the contractors. But even there, I can speak to it. From a construction process standpoint, NiSource, going back through its lineage with Columbia and NIPSCO, you know, we've been around for a hundred-plus years. Pretty proud of the

body of knowledge that we've gathered and incorporated into our standards, our how-to. Not only what we have to do, that sort of, you know, that core part of it, this looks like 192. It doesn't really tell you how to do it. Our standards go into the how you accomplish those things. And they didn't get there by mistake. It was, you know, lessons learned over many, many years that are incorporated into those standards.

One of my engineering groups, I mentioned earlier, is the standards team. And their role is to gather that information, make adjustments to the standards by using a group of teams we call SMRs, subject matter representatives. It's almost like a legislative body. And we've got 10 groups, 10 or 12 groups. One of those groups is a construction team that are representatives from all seven states that can speak to the right way, in their mind, to do certain construction activities and adjust the standards accordingly. We have an engineering SMR group. We've got a leakage and corrosion SMR group.

So, to your point around construction and how to reduce risk, manage that risk, documentation of, and continuous improvement along with that, of those processes that are standards, I think, goes a long ways towards, you know, managing that risk.

You also mentioned OQ. Well, I don't know that you specifically said that. But, when I think about our contractors or our internal employees that are doing the physical work, the OQ process plays into that, as well. Our inspection process that we

have coordinators -- you know, one of the interesting things you learn when you do the benchmarking effort, you know, I mentioned earlier, some companies choose to turnkey work with a contractor. Say here's the package, go back and tell us when it's done. We've never done that. Our process has always been, you know, providing a level of oversight during the process with those contractors. So we've got coordinators and inspectors that participate in these projects.

But, in addition to that, we make sure everybody's operator qualified to meet, you know, the 192 requirements. We've done that even ahead of -- beyond the 192 requirements. Because I'm not sure how familiar you are with it, but OQ doesn't have to be applied to, like, new business construction. We've always applied it to contractors doing new business work as well as replacement work. So we've tried to really be on the forefront of managing that risk, and that's another example of how we've done that.

You know, another aspect, I think still on point for what you're asking about, is in our project development phase. This is when we start marrying design with execution. We've incorporated -- informally, we've always had interplay between the engineers and the local operators and the local construction teams. It could be informal, but it's there. That's why I've been insistent that the field engineering teams are collocated in operations. The seven state teams I mentioned don't sit at the headquarters. They are spread across the seven states. I think

there's about 40 different locations. They're out there where the work's being done.

So, a lot of this assessment of a project and what the conditions are and how to mitigate those risks are done in really small group settings: The engineer and the construction person, the engineer and the M&R tech will go visit a project. Hey, let's swing by there on the way to lunch. I mean, it can be that informal.

We instituted something as a milestone item to really make sure that all came together as a -- you know, like a term paper at the end of the analysis called a constructability review 6 or 7 years ago and made that the milestone step of that design phase to say we know we've designed it from a compliance standpoint, now we want to talk from a construction standpoint if we've hit on all the right points from those that are going to build it. Can this thing be constructed safely, efficiently, effectively, the way we've thought about it. That meeting is intended to, and does, help us work through that step before we finalize the design and approve the project.

Q. Um-hum. Um-hum. Okay.

A. Did I get to --

Q. Yeah. Oh, yeah, yeah. No, this is --

A. -- how we're really trying to address risk?

Q. Yeah, yeah. No, it's great. And I appreciate the sort of, you know, broad kind of background. And, you know, we can kind of

go into some of the details, but that's a good overview. So I appreciate that. Sort of while we're kind of just on the broad overview, can you just talk about, you know, generally speaking, what are your safety responsibilities at, you know, your level?

A. The --

Q. In terms of -- well, I can also rephrase to say, I mean, obviously, you know, I'm sure you're going to say safety is a top priority and, you know, that sort of thing. But what do you do on a day-to-day basis? Do you have safety meetings? Are you looking at -- what data are you looking at? You know, is safety one of your primary core activities, or do you have other people that you sort of consult with and talk -- that sort of roll up and report to you? Just walk me though, like, the day-to-day of safety.

A. Yeah, I mean, some of the things are small. We have MeetSafe when we begin here.

Q. Sure.

A. But that's not for show for this group. That's part of our culture now. Even when I have, you know, weekly staff meetings with my direct-reports, we kick off the meeting with a safety moment. You know, what have we seen happening in the last week, whether it be at NiSource or externally, that we could all learn from? So, I mean, small building blocks like that along more of the OSHA-type safety or vehicular kind of safety.

But beyond that, even on a broader scale, part of our performance expectations for our team is around building our

systems so they're safe for the public, they're safe to construct. And those things are represented, you know, several different ways. I don't know if this is appropriate timing or whatever, but one of the documents, Engineering Values and Employee Performance Expectations, safety -- and this is something that's, you know, a little more tangible than the thing you hang on the wall and say these are our guiding principles. This is, you know, not the development program, this is really a way we want to operate.

Just to give you a good -- there's a page on safety. In fact, it's a page and a half on safety. There's a page on professionalism, customer focus, and teamwork and performance and accountability. Beyond, you know, performance reviews and those kind of things, this is the way we want, you know, every day to go.

And some of the items, to your point, on here follow the life-saving rules. You know, it has to do with setting up the work zone, using electronic devices or not using them when you're driving; don't enter a trench or an excavation. Because we have engineers out on job sites. You know, they may be counting on the construction crew to have set up the work zone, but they have to be aware of their presence at it and shout out if it's not set up properly. You know, they've got to wear their PPE, vests, hardhats, glasses, you know, boots, those kind of things. Perform duties in a safe manner according to policies and procedures, use PPE. The list goes on, 15 different items -- 18 different items

related to safety.

The engineers -- I'm trying to remember the most recent count. In each of our company jurisdictions, we've got local safety teams and the state safety teams, and we have, I think the last I checked, 20 to 30 engineers that actually sit on local safety teams and state safety teams. And those topics range well beyond just the pipeline safety. They get into topics around, you know, parking lot traffic, the clearing of ice. If people have a slip/fall kind of thing, what are we doing to make sure those things are happening.

So, the engineering team is encouraged to participate in that. And we recognize that by actually keeping track of how many are involved with those kind of activities and other sort of -- somewhat voluntary, because you can't have everybody on it. But we've got I&D, inclusion and diversity teams; engineers participate in that. So, one of my goals in developing the engineering team is to make sure they're not only very good at core engineering but they're very diversified, as well; that they're part of the operating company, not just the design team. They do a lot more than that.

So, to your question, how do I incorporate safety into the process, you know, there are personal safety things like this, and there are, you know, pipeline safety things that are part of their -- the expectations for them, as well.

Q. Um-hum. Um-hum. Yeah, that's -- no, that's great. I

appreciate the, again, I appreciate the overview. That's very helpful. So, the next thing I want to do, so this is kind of -- you know, I just kind of want to navigate here carefully. I would like to talk about -- you know, obviously, we're here, you know, investigating an accident that occurred in September. And obviously, mostly we're kind of talking about general-level stuff today.

But I would, to the extent that, you know, from your perspective, that you can comment on this incident or maybe just talk generally speaking about the way you would go about setting up a project of similar magnitude, scale in this location, you know, kind of just talk through some of the specifics of the engineering design flow process. Well, let me just say, I mean, are you familiar with the wider context of the work that was being performed, you know, before the incident in September?

A. Yeah, familiar from, to your words, the wider context. I mentioned earlier when I was speaking to Optimain and the risk analysis and identification of, you know, possible replacement projects and the prioritizing them. And I'm aware that, you know, this project was identified as part of that process. And then I can pick up from there in a more generic sense of, you know, once a project's identified, what steps we start going through to, you know, perform the design for that project.

Q. Yeah. Yeah. Yeah, walk me through it.

A. Okay. So, you know, this is our normal training and

development for engineers on the methodology. You know, the NiSource method, you could say.

Q. Yeah.

A. Once we've identified a project -- and this would be true whether it's through Optimain or whether a municipality came to us and said, hey, we're going to replace our street, you know, curb to curb, or under drains, or sanitary, or, you know, storm drains in this area. Whatever initiates a project, it could be new business, the next steps are really typically and normal for all project development.

First, is to, you know, define the scope around -- think of it as drawing a bubble on the map. How much of a project do we need to do to address whatever initiated this? You know, on priority replacement projects, you know, that often is based on the history of the pipe and the kind of pipe, any, you know, operational issues we've had, to try and encompass that into that bubble, you know, that polygon around that.

Following that, the engineer would look at what that system does, what it serves in the way of customer base, what its performance in the past has been. We also, taking opportunities, we move from legacy systems to newer ones to look for opportunities to not only modernize the materials but also modernize the functionality. And that very often means moving it from, you know, a lower-pressure system to an elevated pound system that allows us to use smaller diameter pipe, allows us not

to have as many regulator stations, pressure-cutting stations to serve that same area.

So that, regardless of whether it's, you know, a situation in Lawrence or something in Kentucky, we go through that same step: What are the attributes of the system and how can we align that with our strategy going forward of modernizing that system to a new function, not only materials but let at that more elevated pressure, more efficient.

That's also a spot where they'll engage one of the specialty groups I mentioned, the gas system planning that does the macro plans. Almost think of it like the transportation department for highways. You know, that's the group that decides whether this should be an artery with four lanes or it's going to stay a two-lane street. The gas system planning is doing that with our systems. They look at the pipe size and pressure in more -- you know, whether it's an arterial system or a local delivery system in the long term and provide that to the field engineer to factor into their design plan.

So, that stage is their getting arms around what that will look like in its next life. They're gathering all that information before they actually really start putting pen to paper, electrons to the computer in their CAD drawings and laying out a design going forward.

I mentioned it earlier; it's part of collecting information in that phase. The other group of information they'll be

collecting is talking to the local operators, the construction team, the system operations, the leaders that repair the leaks on that line. What do you know about this streak? You know, what's going on here? What's been your experience? Not all of it makes it into the database.

So they factor all those into a plan for type of facility and route for the facility and then start putting that into an actual design package, do the CAD drawings for the plan, do the online work management estimate and build materials, test plan, tie-in plan. It's a checklist, pretty extensive, as well as the standards. Earlier, I mentioned the construction standards; they're similar. The documentation for the engineers on considerations as they go through these designs: Where do we need valves in that system in order to, you know, operate it safely going forward?

So all of that fact gathering then gets documented into a design, into a plan. There's informal discussions on constructability and functionality that then culminate in that constructability review I mentioned. Right before the job is approved, both from a functional design standpoint and also from a, you know, a capital investment opportunity or perspective, there is a constructability review held with the stakeholders that we think are, you know, directly involved in this project.

The core is always engineering and construction, and then we'll pull in other participants that we need to hear from, the

stakeholders that seem to be directly impacted by the project. And, you know, if there's any unique characteristics about a project, that often will result in more people being involved. You know, if we're going to build a transmission line, transmission-class seal, higher pressure, there will be a larger group involved compared to a we're going to put a 2-inch line through a subdivision to serve 20 new homes. There's not a lot of controversy or design variability in something like that. So, based on the type of project, the environmental conditions, you know, what we recognize we're impacting, we'll adjust the participant level based on that.

The outcome of that constructability review, you know, if you were drawing a process map, there'd be a little bit of a do loop right there to go back and adjust the design accordingly, and then move it on through. If it was a big change, might have to do the constructability review again. But most of the time, it's minor adjustments, and engineering will make those adjustments and then move it on to finalizing the design, getting the approvals, and putting it in the queue for scheduling a construction.

Our goal is to do those, you know, well in advance so they can be planned into the construction cycle effectively. We try not to do those last minute, that way we can really work it out with the city for permitting and contractor resources and all those kind of things. So we're not -- we're doing our best not to have constructability reviews today and then start moving next

week. We're trying to be, you know, months in advance, if not longer. For some of the bigger items, it should be much earlier.

Q. Um-hum. Um-hum. I gotcha. I gotcha.

A. And then the engineer, their job's not done at that point. I've often referred to it or thought of it as a sort of a relay race; that the engineer's responsible for the first lap. But after, they hand the baton off to the scheduling to do the second lap, and then construction to do the third lap, and then there's a closeout cycle to do the fourth lap. After the engineer hands off the baton, they don't get to lave the field. They're still shepherding that project as the project engineer throughout the lifecycle, Because there's always things that come up.

We're talking about designing and building things that are below ground. There is no way to know everything that is below ground without -- bottom line is, engineers stay engaged throughout the process so they can help with any adjustments that are needed, and the changes to that project. So, throughout the rest of its lifecycle, the engineer is still, you know, accountable for the design of that project.

Q. Um-hum. Um-hum. Okay. Yeah, that's really, really helpful. I've got a bunch of follow-up questions. By the way, if you need a break at any point, you just let us know. We can pause. Okay. So, let's talk about, to the extent that you can comment on, the project in Merrimack Valley. Or if not, a similar project. Do you know what -- would you sign off on a project of that

magnitude, you personally? I mean, can you talk about the sign-off process in terms of how big a project has to be, who has to sign off on it?

A. Yeah, I can. And if you think about sign-offs on a project, there's really two. And I mentioned a little bit ago there's really two concurrent paths that are going on. One is from the specifics of the design, the other is from a, you know, financial investment prioritization perspective.

Q. Okay.

A. As they come to me -- and we have dollar thresholds. Certain size projects are signed off completely, you know, at this level. Others, when they get to a certain size, come, you know, to the leader level, to the manager level, to the director level, even to the VP or the senior VP levels. The further it goes up that chain, more the focus is around the investment side, you know, the capital authorization for that project.

At my level, I'm still looking at the strategy of the design, but not the specifics of the design. You know, I mentioned earlier our goal is to modernize systems. So I'll take a look and see if this legacy system is a low-pressure system, are we upgrading that to a medium-pressure system; are we taking inches water column system and turning it into a, you know, 40, 50, 60-pound system and tying it in with that kind of a network. I'll look for things like that.

Q. Okay.

A. I do not get down into looking at the level of detail the design engineer would have looked at, every, you know, foot of those facilities to try to find out, you know, what's there and what we're going to put in its place.

So, you know, sort of summing it up, the closer it comes to my level and beyond, less about the details of the design and more about the program and how this project fits in the overall program.

Q. Okay. Okay. So, when you're reviewing something, just to clarify, is there -- are you taking any safety considerations into it, or is it more a macro level, money, bigger business strategy kind of thing?

A. No, I'm looking for outliers. If it's a, you know, a high-pressure transmission project -- one of our strategies is to use the right level pressure for the right level situation. And if we start designing for transmission class, there's some mitigating things we can do. Some of it's for ongoing simplification of operation and maintenance. To me, that is changing the risk level.

Q. Okay.

A. Simplifying and reducing the risk level. And I'll ask questions around major projects. If, for example, we're putting in -- we just received the approval at the highest level for -- I mean, this is at the spectrum at the other end of, you know, the (indiscernible) project. We're going to do a hundred-

some-million-dollar outer belt line. Think of it almost like a highway outer belt for a city here in northern Columbus, 135-, $140 million, you know, 20, 30 miles of 24-inch, 720-pound design line.

When I look at those, I'll ask the question, you know, what design factors could we adjust. You know, do we really need that level of pressure? Can we do something to reduce the SMYS level? I don't know if you're familiar with the stress level on a pipe, but if it gets above 20-percent SMYS, then it's in transmission class. There's things you can do to mitigate that, to bring the stress level down: thicker-wall pipe, higher-tensile-strength pipe. So, on special projects that are somewhat outliers, you know, I'll start asking more questions like that.

Q. Okay.

A. For our low-pressure, medium-pressure, things up through 60 pounds, those are really bread and butter and things we do hundreds of miles a year. Like I said, we do about 3- to 4,000 projects every year. And those exceptions I just mentioned are in the dozens compared to the others that are in the thousands, that really are normal, plastic, standard wall thickness, 40, 50, 60-pound pipe.

Occasionally, I'll see an outlier where I know in this state, you know, we've typically laid pressures up to 60 pounds. Classic will let you go to 99 pounds with some changes. You know, we've been taking advantage of that in some new states. But if it's new

to the operating area, I'll ask the question have we spoken with operations about introducing a new type of facility in their area to drive that interaction with local operations. But those are usually a very small quantity, as well.

So as it gets, you know, more at my level, that's the level of involvement I get with the design part of it, looking for unusual or outlier-type of facilities.

Q. Um-hum. Um-hum. I gotcha. I gotcha. So there is some safety element, or there could be, you know, with what you're looking at in terms of the risk of the system, but it's more at a high level when you're looking at it?

A. Correct. Yeah, certainly with, you know, our standard plastic design, you know, we've taken that into account in our set of standards, your typical approach to installing those pipes. We're not -- the engineers aren't designing those from a blank sheet of paper. There's going to be a lot of guidance in the standards on what this material is qualified to do by industry standards, not just, you know, our preferences within that. It's only when you get into sort of unusual scenarios that it takes more discussion.

Q. Gotcha. Gotcha. Okay. So, obviously, a project that's, you know, $140 million, you're going to have to see it because, you know, you're the director. What's the sort of threshold? I don't know, is there a hard number or is it more --

A. Yeah, there is a hard number. The local engineers can sign

off on projects up to $100,000, and the leaders agreement that they're ready for that.
Q. Okay.
A. That type of project. The leaders -- I hope I get this right. Forgive me if I miss it by a little bit.
Q. Yeah, give me an idea.
A. You'll get a sense of the numbers.
Q. Yeah.
A. The leaders, I believe it's $250,000.
Q. Okay.
A. And this includes not only the main line but the service lines, the restoration. A lot of times, half of our costs of a project could be the service restoration. The managers are a million dollars. And this is on replacement work. And then after a million, it comes to me.
Q. Okay. Okay. So a million. Okay. Okay, that's helpful. And again, if you can't comment on the specifics, that's okay, but were you -- did you have to sign off on the larger project of, you know, what was going on in Merrimack Valley before the incident? Not the lower-level stuff, but I mean were you aware that there was a pipeline replacement project going on there? Did you have to sign off on that at a high level at some point?
A. Yeah, from that sense, yeah, I think it's documented that I did see it. But I didn't go into the specifics because it really still fell within the, you know, what I called the bread and

butter, the normal installations. It was nothing unusual in the planning that I saw that was different than our normal, you know, strategy for replacement, upgrade from low pressure to 99 pounds, and that's a very common pressure level in Massachusetts.

Q. Okay.

A. Operations is used to that level system.

Q. I gotcha. Do you know what financial level that was at? Was it, you know, 1.2 million, 1.5? Don't recall?

A. I don't recall.

Q. Okay. That's okay. That's okay. So, in terms of something that's about that scope, how many of those would you say you sign off on in a given week? Or is it not even every week? Give me kind of a frequency. I mean, how often are these coming across your desk?

A. You know, not scientifically tracked, but just to give you a sample, I hadn't been into our system for a little while, a week or so, and I had built up over probably 3 or 4 weeks, I think, 10 or so. So it's a two or three a week kind of thing.

Q. Okay. Okay.

A. This year, it's probably a little higher rate because we're still, you know, prepping for 2019 construction work. I have the statistics but I didn't memorize them. If it's important, we can follow up with an answer to that and I can tell you exactly how many there are.

Q. Oh, no, that's okay.

A. But it's a really -- out of the, you know, 3- to 4,000, it's a really low percentage.
Q. Okay. Okay. And just to clarify, is that maybe two to three a week of -- that's how many projects total you're reviewing, or two to three a week that are about the size of something like that?
A. They would be one and the same.
Q. Okay, because they're all -- about that size is above a million.
A. Once they break that threshold of a million, they're coming to me. And then if they're larger, I advance them on to, you know, to Chuck Shafer that I report to.
Q. I gotcha. I gotcha. And so, I don't expect you to recall exactly how long you spent looking at that document or anything like that, but would you say that you, you know, generally spend a certain amount of time on each, or does it kind of depend more on the complexity of the project in terms of, you know, how much time you spend reviewing it, the projects?
A. It'll come back to those variables I mentioned earlier.
Q. Okay.
A. If we're putting in a normal distribution system, you know, it's plastic, it's regular, and we're hitting on our strategy of upgrading from low pressure to some kind of elevated pressure. We've organized the submittal report, we call it a project budget request, to describe the project in four or five bullet points,

and then put some of the critical metrics around it: How much footage of different pipe kind and size being installed; how much is being retired; what the dollar per foot is; how much is on main and how much is on service line. So, in one page, I get a really quick view of that project, you know, in a Word document.

And, you know, I certainly take a look at that information. And if anything in that, you know, sparks a question or an interest, you know, I might spend more time on it and start making some phone calls to try to find out, you know, how did you get to this solution. Depending on the, you know, the manager and the leader, you know, and how much I've talked to them in the past, I have a better, you know, possible understanding of the area conditions. You know, with some of the new leaders, I might have made more calls, you know, a year ago or 5 years ago, until I got an understanding of what was going on in western PA compared to Virginia.

Q. Gotcha. Gotcha. Okay. Okay. And that's actually kind of the next segue. So, I think I've got a decent understanding sort of at your level. You know, it sounds like this was kind of a standard replacement project and, you know, probably didn't require any special analysis. Correct me if I'm wrong on that.

A. Correct. No, you're right on with that.

Q. Am I? Okay. Okay. Okay. So Mr. Mueller or Mr. Mueller is your --

A. Mueller.

Q. Okay, Mr. Mueller is --
A. Yeah, don't confuse the two.
Q. Yeah. So he's the manager of Massachusetts?
A. Yeah, the field engineering group in Massachusetts reports to Dave Mueller.
Q. Okay. Okay. So, what's your relationship with him? I mean, you know, your working relationship. How often do you guys talk, what do you -- you know, how do you guys get along, how do things work out between you guys, you know.
A. Get along well. Let me answer the how often we talk. I've got a standing group call with all my managers as a group. Somebody's covering for me, but it's going on right now. Every Thursday morning at 9 o'clock for about an hour and a half, hour and 45 minutes, we meet. In addition to that, I have a twice-a-month, every 2 weeks call one on one with every one of the managers for an hour or so. So, you know, without the in-between calls, there's at least, you know, three meetings a month where I'm meeting with all my direct-reports.
Q. Okay. Okay.
A. With most of them, there are, you know, quite a few calls in between. It's sort of a necessity with the long distance relationship with the six or seven states. And I've grown pretty accustom and pretty effective, I think, at that long distance kind of relationship to keep abreast of what's going on. So, the calls go both ways.

Q. Gotcha.
A. I've been on the phone with Dave on other things twice this week, I think, already, talking about other --
Q. Okay.
A. You know, things ranging from systems to people to capital. You know, whatever the topic might be.
Q. I gotcha. So you guys are in pretty regular contact, coordination. So --
A. He and I are somewhat contemporaries, as well. He's got a pretty wide background, as I do. He came up through operations, engineering and operations, has a similar -- I think he's been with the company close to 40 years. I said I've been 37. So similar backgrounds, so I think it makes it really effective for us to, you know, bounce different ideas off of each other.
Q. Um-hum. Um-hum. Okay. So good working relationship. So just to clarify, let's say a project is coming up, is Dave, like, emailing that to you, or maybe Dave's, you know, secretary or something like that? You know, in terms of a project, is it -- how does it --
A. Well, we've got a system called our work management system, and then it's got a companion called WMS docs, which is a document management system that supports our work management system, and it has workflows in it that things get routed electronically. When the engineer places the package together, then they launch it on a path to get, you know, whatever level approval is needed. And

that system is used to document the process flow.
Q. Okay. Okay. And if you don't recall that's fine; do you recall ever having a discussion with Dave about this particular project?
A. No, I don't.
Q. Okay.
A. I do not recall.
Q. Okay. Would it have been possible that you guys didn't have a conversation, that it just showed up in your system and you, you know, you had to tick it off because it --
A. Yeah, it's very possible.
Q. -- exceeded a million, but then it was such a vanilla, plain Jane project that there was no reason to pick up the phone?
A. That's correct.
Q. Okay.
A. It's very possible.
Q. Okay. Okay. So let's kind of -- we kind of talked about, like, at your level, your relationship with, you know, Dave. So, what are your expectations for Dave signing off on that project? So, is he also -- so he's also signing off on that project?
A. Yes.
Q. Okay. So, what, yeah, what is your expectation of what he's doing with it?
A. As I mentioned, before I see that his project moves through the approval cycle, there's really two things that are in play.

One is the design at the detail level, and then less and less at the detail level than the others around the capital program perspective of it. As it moves towards me, as I described, it's less about the details of the design, more about the strategy, whether this, you know, projects aligns with our overall strategy. It becomes more about the, you know, the capital investment opportunity. So that mix at Dave's level, you know, is still split between those two things, but still far less at the design level details compared to the leader and the engineer as they're releasing the project.

Each of the managers, you know, have even a better knowledge of the personnel they have in their organization. So, you know, my expectations of each of the managers is -- and the leaders, is depending on the engineer, you know, their experience level, their knowledge level, you know, how long they've been with us and designing for us and working these projects. They should also regulate how much time is spent. If you've got a senior engineer that's been designing projects for 20 years, you're going to look at it through a little different lens than if you've got an engineer that's been here 2 or 3 years.

Q. Right. Right.

A. Our goal in all of that is to develop engineers to the point, you know, and very quickly, of being more and more autonomous. But to do that, you certainly work them through and give them more autonomy on simpler projects early on, more complicated projects

as we go forward. The leaders have the best knowledge of this personnel and their level of development. You know, and then Dave has a little less knowledge of it, but his interaction would be with the leaders to keep abreast of those, to the variables.

Q. Um-hum. Um-hum. I gotcha. I gotcha. So, would you know, I mean, how many of those leaders of the field engineers do you think, or do you know does Dave have?

A. He's got two leaders.

Q. He's got two leaders. Okay. Okay. I gotcha. And so that's for the entire state of Massachusetts?

A. Correct.

Q. Okay. Okay. I gotcha. And then how many field engineers do you think he would have for the state, for Massachusetts?

A. It's around 20.

Q. Twenty. Okay.

A. Probably not an exact number. Typically, the leader -- or engineer to leader role, our ratio, like, 1 to 10. The other way around, leaders to engineers is sort of a 1 to 10 ratio.

Q. Okay. Okay.

A. I do need to take a break for a couple minutes.

Q. Oh, absolutely. Absolutely. Yeah, no, me too. No, seriously.

(Off the record.)

(On the record.)

DR. HOEPF: And we are back on the record.

BY DR. HOEPF:

Q. Okay. So, we were talking about some of the different -- you know, we were talking about the manager of engineering level and the leader of field engineering level, and just kind of comparing and contrasting what, you know, goes into the review process at each level. If you could maybe kind of comment on, you know, what you see each one of those people doing, you know, just from your perspective. I mean, obviously, you know, you can't know all the details, but just generally speaking, you know, what are you expecting to happen at each level?

A. I'm trying to figure out this package, the answer. Looking at it from a sort of fuller spectrum first, and I'll try to keep it short so we don't hold up Rob any further, but the whole of field engineering, I've always characterized their responsibility, that part of the team's responsibility in four sort of broad arenas. One is capital management, you know, the overall investment program that we have in that state, and back to the risk analysis, you know, we talked about earlier and where, you know, those dollars are best invested.

A lot of management is stakeholder input and those kind of things. Another is in the design process, which we talked about pretty thoroughly. Another is in project engineering. And I look at that as you start with a design, and then there is execution of the project where the engineers are still involved even though it's gone to the next leg of the race.

And then the fourth category is operation support. Those engineers are also involved with winter operations. This time of year, you know, actually, it's a whole cycle throughout the year of making sure the systems and the people, equipment are ready for sub-zero temperatures. If there's some kind of an outage event, working through the restoration process. The engineering team's part of solving those.

You heard some yesterday about SMS. And as ideas are generated under SMS, many of those are going to require a technical investigation to look into, you know, what's behind that idea. The engineers are going to be involved in that quite a bit. I consider that part of the operation support.

So, with those four categories, capital, design, project engineering and operation support, the managers and the leaders are responsible for making sure, you know, we're delivering on all four of those categories. So it's not just about, you know, design and capital management. In order to enable those categories, they're responsible, especially the frontline leader, responsible for the development of the engineering staff.

And that's been a big focus. It's always been a big focus, but in the last 10 years we have really ramped up our dedication as a company to replacing our infrastructure. You know, over the last decade, we have replaced thousands of miles of pipeline. Essentially, we built a machine, you know, an organizational machine to do that, and brought in -- you know, we made a

conscious decision to do as much of that design process in house with our own engineers because, long term, it's a lot more effective to do that.

If you've got a, you know, 2-decade program, that knowledge, the local capability you develop is a lot more effective than a consultant kind of approach that only really gets you that element, the design engineering part. And even there, you know, they're challenged to do it. In fact, we're, you know, incurring some of these issues now. There's a lot more turnover, retraining. They don't have the relationships. The stakeholder reviews that we were talking about, the informal, you know, meetings that the engineers and the local operations have, you don't get that with a third party.

So, we made a conscious decision a decade ago that we're going to really grow our internal capabilities around engineering. It coincided with a much more structured development program for those engineers. Years past, even probably when I was coming up through the program, the ratio of established engineers with a lot of experience that could really, you know, be that development program for a new engineer was such that there was enough to go around to train newer engineers. With, you know, this ramp up of doubling and tripling and now quadruple, having quadrupled, or so, our capital program, you've got to do it a little differently. So we put in a much more structured development program.

So, when you asked the question about, you know, the manager

and the leader's role, one of the biggest roles is making sure that the, you know, the leader of their 10 engineers or so are getting that development, that extra knowledge and progression that they're capable of designing the projects, and being aware of which ones are still, you know, developing in which areas and which ones they showed a level of competence that less oversight was necessary. So, my expectations of a manager and the engineering leader, first and foremost, is to build a team that can accomplish those.

You know, in conjunction with that, the output has still got to be well-designed projects. But they've got to -- you know, in my expectations, they dedicate enough time to both elements; that they're developing the engineering team as well as making sure that the projects are well designed and meet our strategy goals.

Q. Right. Right. So I think -- I appreciate what you're saying about, you know, as the leader, you know, if you're a leader of field engineering, you know, you've got to build up your team of engineers and you've got to have an understanding of their level of competence in terms of, you know, how much you're going to need to kind of oversee what they're doing. You know, if you've got somebody with 20 years of experience, that's a little bit different than somebody with 2 years of experience.

A. But interesting, depending on the type of project, if you've got 2 years of experience, you could be -- I mean, we're hiring degreed engineers.

Q. Right.
A. They have a good head start. And in the last 5 years, we've actually hired, across the states, about 40 engineers that co-oped with us, did an internship of 1, 2, 3 cycles. About half of our engineers are coming from that kind of an internship; that they're on semester programs, and alternating semesters, you know, they will spend with us. So, we're hiring a lot of brand-new engineers, you know, quote marks on both sides, that are coming to us with, you know, nearly, you know, a half a year or a year's worth of experience, which has been, you know, a great thing, as well.
Q. Yeah. Yeah, it sounds like you've got some pretty positive things to say about, you know, getting people to that initial engineer position in terms of getting them -- you know, we talked about training some yesterday and, you know, the on-boarding process and trying to get people up to speed to meet the high demand that you've got for that role. So I think that's interesting. I'm sorry, you had a comment with the page there.
A. Yeah, I'll wind it in, weave it in right now, you know, another comment around a different approach. You know, our interns have shared this with us; that our approach at on-boarding them compared to the work they get in many instances -- and, you know, I don't know if back in your career if you interned someplace. If you had the choice between an internship which was, you know, sitting down to do some busy work, a lot of filing, a

lot of, you know, sort of single-minded analysis, here, crunch these numbers for the next 3 weeks, we don't do that.

Q. Right.

A. We bring our interns in as if they're new hires and we start putting them through our development program just as if they were on board permanent. Which gives them not only orientation to the company, but they actually start in on that learning process.

And, you know, what he was reminding me I had laid here is, you know, when we put this program together, I alluded to it earlier -- you know, this is from 2012 to '14, when we built this formal approach -- we laid out sort of the first 3 years of an engineer's life with us, what's that look like.

One of the things that I think is really important for an engineer -- and sometimes we've got to encourage them, as well -- a lot of that focus or mind goes towards the technical competencies. And we do a lot of that. But, in addition to those technical competencies around, you know, design and standards, you know, the top of the list is safety. Just even the way we bulleted them out: Safety and administrative things, how do you stay safe in this organization, how do you execute the administrative things; engineering, technical and standards, observation of operations activities. Which if I go into all the set bullet points --

But we put them out in the field to do ride-alongs with a construction person, with a service tech, with a measurement

regulation tech. We'll make sure they get into our centralized functions, our new business functions, call centers, to make sure they're listening in on that process and really get a well-rounded understanding of not just engineering but how it fits in with everything else so they understand the stakeholders that are involved. And then, you know, also development in the area of technology, the tools and software they need to use. And it was --

Just to give you a sense of where I see my role with the engineering group, my first -- we looked at a draft of this. We talked about -- you know, I asked, well, where are the soft skills? Well, they've got technical writing listed in here, isn't that a soft skill?

(Laughter.)

MR. SWIGER: No. No. That's now what I mean by soft skill. I'm talking about training people to be able to sit down and have discussions like this, to have, you know, powerful conversations with construction, with our contractor. So, we made sure those elements are in there, as well, those kind of personal development, soft skill development skills; that, you know, they'll take, you know, a couple classes every year, especially in their first 3 or 4 years with the company, to hit on those kind of skill sets. And that way, they're not just focused on --

Yeah, I think the other one, when we're talking about soft skills, well, we have business acumen. You mean payback analysis?

That's not a soft skill. It's just a little less hard skill.

BY DR. HOEPF:

Q. Yeah.

A. So, you know, obviously, as you can see, I'm pretty proud of the program.

Q. Yeah. Yeah.

A. And it's done a lot around competency level and retention level and our -- annually, we do employee engagement, you know, questionnaires that go out, a culture survey kind of thing. And two things, without getting into all the details and the analysis, I'm really proud of is, first, the participation is almost a hundred percent. I think the only ones we miss are people that just happened to code something wrong and they put themselves in another department. So 97, 98 percent of the engineers participate.

And then if you sum up all of the scores, we're well into the 90-percent level of I like what I'm doing. I see the value in it. I understand what I'm doing. You know, I appreciate the leadership of the development. And then you stack those up against the study that we have done that provides industry benchmarks, you know, what it looks like in other industries, and in almost everything we're 20 points out ahead of any of our peers out there within the engineering group. I mean, we're out ahead of NiSource as a whole, actually, as well.

Q. Interesting. Interesting.

A. So, you know, I think that all starts with things like this and clear expectations, clear development programs, knowing how to get from where you start to where you want to go, where we want to go as a group.

Q. Yeah.

A. Understanding where we want to go.

Q. Yeah. Yeah. Well, no, I appreciate the, you know, the perspective. I mean, again, it sounds like, you know, you're pretty, from your perspective, you're pretty happy with the, you know, bringing in, you know, a new field engineer. So I appreciate the, you know, the discussion. We've covered a lot of good ground here. I promise I'm coming to the end of my questions.

I do want to just back up a little bit and just touch a little bit more on -- you know, we're kind of going through the process, and I think, you know, we've got a pretty good idea of what you do to prepare a new field engineer. I understand your position. I just want to talk a little bit more, kind of go back to the leader of field engineering versus, like, a manager of field engineering. And just, again, kind of the view from your perspective, the manager of engineering. So, you know, somebody like Dave, you know, is he kind of -- is it kind of -- is it still a pretty high-level review when he's reviewing projects, where it just kind of depends on, you know, how complex the project is?

A. Yeah. Yes. It's a similar litmus test that I described for

myself.
Q. Okay.
A. So he's not going to, you know -- I don't know what the numbers are in Massachusetts. I have them somewhere in a database, but I don't have them on the tip of my tongue.
Q. Okay.
A. But if I get 3- or 4,000 total, you know, Dave's probably got, you know, certainly in the hundreds of projects that come through.
Q. Okay. Okay.
A. In Massachusetts.
Q. I gotcha I gotcha.
A. I mean, they do somewhere in the neighborhood of $100 million worth of work a year. So he's going to have the same kind of balance between the review that I talked about. A little closer to the source, or to the design part, but still more strategic in nature and, by exception, he just might look at a few more that are the exceptions. He's certainly not, and I don't set the expectation that he's going into detail of design for every one of the projects.
Q. Okay. Okay. Right, right. So you would not be -- you're not expecting that he's going to be doing a microanalysis of every little thing, nor would that be feasible in a given 40-hour work week for him to go into that level of detail.
A. I don't think he's seen one of those, but yes.

Q. Yeah. Yeah. Right. Fair enough.
A. Exactly. And, you know, and that's not the only time he talks to his team about designs. I know Dave specifically, and Massachusetts is a little different depending on the organizational layout and the logistics, but he has, typically, monthly meetings as a group with the leaders and the engineering team.
Q. Right. Okay.
A. And that gives them the chance to talk about design scenarios. You know, more of a learning opportunity. It isn't really a way to review the projects, but it's a way to keep the team aligned on what the expectations are. You know, in this scenario, this is what we're looking at doing. You know, together they develop the -- there's a requirement in Massachusetts to submit annually what's called a G-set listing, which is a planned list of projects for the next year.

So, you know, he'll work with them to set that, you know, the expectations of how many there ought to be, you know, what the mix ought to be, some of the strategies around the risk analysis we talked about earlier and what the special criteria ought to be, you know, specific to Massachusetts. Massachusetts has some of the higher occurrences of cast iron pipe compared to the rest of the company. So you look at cast iron a little differently than bare steel.
Q. Okay.

A. So, yeah, his role as a manager is to really take the, you know, the broad strokes of strategy and make them more specific for the engineering team of Massachusetts so they know how to apply it to the information they're seeing, as well as the design philosophies.

Q. Right.

A. But again, not trying to go through hundreds of individual projects as the manager to look at them under the microscope, as you mentioned a little bit ago.

Q. Yeah. Yeah. Okay. Okay. I gotcha. I gotcha. And I'm sure you can guess what my next question is going to be, then. So, let's talk a little bit at the local level, then. So, how about at the, you know, the leader level? You know, let's talk -- what is their review of a project look like? How much detail does that go into?

A. And that's where that leader certainly knows the individuals that he has reporting, they have reporting to them, and their strengths, their opportunities of still being on the development cycle. Some of it can be differentiated based on the title. We actually have a four-level title job family ranging from an associate 1, associate 2, engineer and senior engineer. So that gives them, you know, some recognition, but it goes well beyond that, knowing the person, as well, that they're working with and where they may have strengths or things that they need to, you know, have a little more assistance in the process.

Q. Okay.
A. And in addition to that, depending on the nature, the type of project, especially, you know, changes as an engineer moves from their first 2 or 3 months to, you know, a year to 2 years. There also would be, you know, more tenured engineers, you know, locally there that they can reach out to and lean on in addition to, you know, the leader themselves. And that's very specific to a local situation.
Q. Okay.
A. Who's there in the office, what's the capability level of the other engineers. You know, if we were to go through a detail in the advancement criteria, there are a lot of different types of projects, and a lot of variables that go along with it, to identify which one this person's already, you know, been recognized as capable. They've had experience in this area, this type of project, so they'll need a little less support in that.
And that's a lot of what I, you know, expect, Dave expects of those leaders, to recognize, you know, where an engineer has already advanced to this level versus, you know, this scenario that they may need a little more guidance and direction, a little more checks and balances as they go through the design process. And I, you know, programmatically look to the leaders to really understand that level of strength and apply it locally.
Q. I gotcha. I gotcha. Okay. So a pretty big emphasis is, you know, placed on understanding the -- you know, how competent -- or

I shouldn't say competent, but just how much mastery these field engineers have.

A. That's a good word, yes.

Q. Yeah. I saw that you're -- we talked about training and your charts, and you get to sort of a proficient level, and then --

A. I thought of Chepke when you used the word mastery. I don't know if he used that yesterday?

Q. Yeah. Yeah.

UNIDENTIFIED SPEAKER: In the hallway.

MR. SWIGER: In the hallway?

BY DR. HOEPF:

Q. Yeah, we saw the -- yeah.

A. That's a very good term for what I was describing, as well.

Q. So maybe somebody's proficient, they're trained but need a little bit more oversight, whereas maybe somebody else has really reached that mastery level and can operate a little bit more autonomously. So, you know, you allow that local leader to, you know, sort of portion their time as they need to, to, you know, balance the engineering horsepower. I mean, is that kind of a fair characterization?

A. Exactly right.

Q. Okay.

A. And, you know, they will -- we've got the engineers, as I said earlier, spread across, you know, maybe it's about 40 -- I haven't added it up lately -- 40 physical locations. The idea is

that an engineer has responsibility for a geographic -- or maybe a couple depending. You know, here in Columbus, you know, there's about half a million customers right here in Columbus and there's, you know, 15 engineers in this jurisdiction for that much. You really can't carve it up into 15 slices and say this is your slice of town.

Q. Right.

A. Hey, you get Whitehall, because it's too interactive that way. So there might be two or three engineers that do the, you know, the southeast side. And in Massachusetts, similar idea; that there's -- geographic assignments is one way to look at assigning work out, to have that engineer responsible for Lawrence, or that engineer is responsible for Springfield, or a subset of Springfield. So, for those that have developed the mastery, you can do that almost blindly. You can just say, yep, I'm going to give all the projects that come up in this one town to that person that's already got the mastery.

But in order to develop the engineers, you also have to recognize where they haven't got the mastery, and then you start moving projects around, sometimes to play into the strengths, but sometimes to play into the development opportunities. And I expect the leader to be able to figure out when it's the right time and the right type of work to give a stretch assignment to somebody. To say, hey, you've mastered this, so now let's take it one step further and let you work on this, and even override sort

of the geographic responsibilities and the holistic responsibility for an area.

And that's all, you know, in that leader's realm, with the manager, you know, giving the, you know, strategic and philosophic report. But executing is really up to the leader. To balance the workload based on volume, but also on mastery and development opportunities.

Q. Right, right, right. So Mr. Kulig was the leader in the situation. Do you know him personally or is he kind of too far down from --

A. No, I know him.

Q. Oh, you know him. Okay. What do you think of him? Is he pretty good at his job? Any concerns with how he goes about --

A. No, there weren't concerns. You know, actually, he was put in that role after I took over the directorship, and I was, you know, encouraged with him moving into that position. I had known him before, actually. He's got external experience through a consulting firm. He is a registered professional engineer. He had been with us, you know, I think a total of 20-some years.

Q. Oh wow. Okay. Yeah.

A. Yeah, he's since moved on to something else. You know, retired from us. But, yeah, I never had a sense of any concern with his capabilities.

Q. Okay. Yeah.

A. I certainly, over time, called him for, you know, counsel and

information on what's going on there in Springfield and other situations. I know we've had him on -- I'm trying to remember which ones. But we've had him on different special projects over the years. I have a strong tendency towards -- we have initiatives we want to take on, you know, developing a program like this or -- they're numerous. Annually, we, this organization, will have 20 or 30 different initiatives that we're taking on. Some are small, you know, we want to tackle this and make it better. Some might be bigger like this. And we'll utilize, you know, participants, owners of those initiatives from across the organization. And Marty's been involved with those things in the past.

Q. Oh, okay. I gotcha.

A. Yeah, he's ---

Q. He's pretty --

A. He's more than just a capable local leader.

Q. Yeah.

A. You know, he's worked with us on, you know, broader things, as well.

Q. I gotcha. I gotcha. Okay. Well, that's interesting that, you know, you've got this -- you know, I wasn't sure if he was too far removed from you, but it sounds like you guys have got a pretty -- you using him as a resource, in fact, to support some other company initiatives and things, so --

A. Yeah, we've got across the organization about 30 leaders.

Q. Okay.
A. And I'm fairly familiar with all of them.
Q. Okay. Okay. Since you're familiar with them, I'll just ask, do you know Mr. DeRoxas, the field engineer?
A. Just by name.
Q. Okay. Okay.
A. When I mentioned Dave Mueller would have, you know, monthly team meetings, I typically, over the years, tried to be up to one or two of those a year. So it would be sort of an introduction or something like that, to be able to put a face and a name together, but not any more detail, really, than that, specifically.
Q. I gotcha. I gotcha. Maybe you shook his hand.
A. Yeah.
Q. Introduced yourself, hey, I'm the director, you know, but not like a -- okay.
A. Correct.
Q. Okay. I gotcha. I gotcha. Tremendously helpful conversation. I'm definitely getting to the end of my, you know, question here. So, let me just ask, and I don't want -- don't go out of your comfort zone here or anything, but just, you know, obviously, like I said, like we've talked about, our goal is just to prevent a reoccurrence. You know, that's all we're trying to do.

And so, you know, it sounds like you've got a pretty competent team in there. It sounds like a pretty robust way that

you're bringing engineers in. You know, we're just trying to understand, you know -- and I understand you're not personally involved with the investigation, but were there any -- you know, we're just trying to find out if there are some weaknesses in the review process or the -- you know, how do you have a situation where the work package comes together and seems to be missing something that's key?

You know, do you have -- I don't want you to speculate, but, I mean, based on, you know, being the director and being at least vaguely familiar with this, do you have any thoughts?

A. Yeah, I do. And again, it's not specific to that project and looking backwards on it, but it's really looking forward at things we have, you know, not only put in motion but are well, you know, knee-deep in making happen, and some things we've already completed across the organization. Several are, you know, specific to what we understand was the gap.

As I mentioned earlier, when an engineer is gathering information on a project, part of what they look at is the facilities, the documentation they have on the facilities that are in the scope of the work. And one of the, you know, the go-forward things, you know, is a recognition that we were short on readily available information around the sensing lines, the control lines.

Q. Okay.

A. And we've done a lot already to bridge that gap and make it

more readily available to the engineers as they're doing a development. What we have done is, you know, confirmed the location of all of our low-pressure sensing lines. I think there might be a few stations out of the 2,000-some that we haven't gotten quite completed yet. There are some local issues on excavation permits and those kind of things. You're shaking your head. You might be aware of it already.

Q. Um-hum.

A. But out of the 2,000-and-70-some, you know, setting stations, the vast majority, even as of, you know, back in November/December timeframe, had visited every one of those. Engineering was certainly a partner with system operations, the M&R, measurement and regulation teams to confirm the location, document the location through station isometric sketches, and then make those available through our GIS system and onsite in the way of a hard copy. So that's certainly one of the, you know, extensive follow-up actions.

It did confirm, you know, that there's a higher occurrence of this remote sensing line in Massachusetts, which, you know, reinforced the need to make sure that documentation was readily available to the engineers as they're doing -- to anybody doing work around those stations.

Q. Right. Right.

A. Which we've done. You know, as we've reported back to NTSB -- and I'm part of this project team, by the way, that's

working -- and Monte, Dave Monte probably spoke to some of these things yesterday on the -- our low-pressure safety plan. You know, part of it is also looking at the design bases for our stations and see if we can put, you know, other safety mechanisms in, in case of some similar event, to prevent, you know, the kind of occurrence that happened in Lawrence at all of our stations. So that's underway, as well. You know, the engineering team has done a lot of analysis. Back to my specialty groups I mentioned?

Q. Yeah. Yeah.

A. The design team and the standards team have been doing, you know, exhaustive searching of, you know, what's out there in the industry, what are other companies doing, not only U.S. based but European based; what's going on there that maybe they've done that we as a U.S. industry haven't went down that path. So, you know, we're working on getting those things shored up and a program put in place. We've already dealt with the information, which I think is -- you know, really moves the needle a lot, that we're going one step -- more than one step further in trying to put in other preventative measures, as well.

Q. Right. Right. Yeah, I appreciate the thought. That's very helpful. You know, we've kind of been trying to think it over and, you know, there's a discussion of the sensing lines. And I understand, you know, you said you've been updating your GIS system, which is a -- that stands for?

A. Geographical information system.

Q. Thanks. Thank you. Okay. And that's through your electronic system that, you know, the engineers would have access to on their tablets or computers or whatever?
A. Not just the engineers but people doing damage prevention locates.
Q. Okay. Okay.
A. Everybody in operations, clear down to the new business team that's -- not that they'd be looking for sensing lines.
Q. Right.
A. But it is our centralized record system that's shared, you know, with the whole organization.
Q. Gotcha.
A. We have a couple ways of delivering that. Three ways, actually. There's the core Esri GIS system, the beefy engine that the engineers use, but then there are more readily consumable versions that are a little more like Google, you know, Maps or something that's called 3GIS. Or there is actually a disconnected version, you know, that the -- in case they're out of, you know, a WiFi-type connection, the field crews can have a disconnected version that they load on their machine. So there's Arc Reader, which is that disc-based, as well as the Google style called 3GIS, or the real core GIS Esri system.
Q. Okay. Okay. I gotcha. So, maybe this is a little bit of a -- I mean, it seems like, you know, you kind of recognize that maybe the recordkeeping could be improved. So just for

clarification, that information about the sensing lines, my understanding was that maybe that would have been available in an old physical book or something like that, if somebody had known about it?

A. Again, I wasn't heavily involved in the investigation, but that's what I have, you know, heard second, thirdhand.

Q. Okay. And it's why I really refer to it as more readily available.

Q. Right.

A. I wasn't implying that it wasn't there someplace. But, you know, ever since -- you know, I mentioned, well, earlier in the discussion that I was involved in developing work management and our GIS system and getting it deployed. That has always been the goal since the early '90s. We're still on the path. It's a journey; not really an endpoint. Is to take in formation that was in somebody's file cabinet, stuck in a binder behind their truck seat -- you know, if you really flash back to pre-computer times in the '60s, '70s, things were in ledger books, they were in three-ring binders, they were just up here, just in somebody's head.

Q. Yeah.

A. And our advancement in the gas industry, in our company of putting a work management system in that has a facility database -- it's not just about managing work, it actually has an asset -- not a plant accounting asset inventory but an operational

inventory. You know, what's the make and model and valve size of our regulators that are out there, our heaters, our test stations, all those things in that tool. And then 15 years later, we come along with GIS and now it gives us a geospatial way of doing it. Coupling it with our, you know, mainframe system of a database with a geographical information database, it opens up more windows, more opportunities.

Q. Right.

A. This is one we realize we didn't get out of the file cabinet. We didn't get it from somebody's binder and make it more readily available.

Q. Gotcha. Yeah. Yeah.

A. So that's what we've done. We've went through and pulled that out of personal storage and made it, you know, available to the whole team so we don't miss something like this.

Q. Yeah. Yeah. I understand that, you know, there's likely to be some growing pains going from a legacy, you know, system to the upgraded, you know, new system. And I mean, don't speculate or anything, but, I mean, is it maybe a possibility that this engineer didn't know to go look in this old legacy system to find this information and, you know -- I mean, well, let me rephrase that because I don't want you to speculate.

But, I mean, how, generally speaking, would you expect -- where would you expect people to get their information from? Would they first go to that GIS system? You know, under what

situations would they go to -- would they know to go look through these legacy systems?

A. To answer part of your question first, the first step is to look at the generally -- you know, the work management GIS.

Q. Okay, that's the first step. Okay.

A. Which is our system of record. You know, I almost want to call it the general system, but it's really the system of record at this point. The other supplemental -- I don't know if I want to call them a system, but document resources. The avenue towards those -- I mentioned earlier when we were talking about leading up to the constructability review as part of the project development, you know, the engineer has many other more informal conversations with the local operators as they're planning out a project. And this isn't over days, it's usually over weeks, and sometimes months, from the identification to the point it's ready for approval.

Those informal conversations -- and again, I don't know the specifics of this evolution for this project in Massachusetts -- but those informal conversations and relationships with the local operators, including system operations that manages the measurement regulation, I feel are really important to try to unearth those things that aren't the core system of records and are ancillary or auxiliary type of, you know, information or data, and that relationship.

Knowing that not everything's made it to the system of

record, that's why I think it's important to have our engineers collocated with operations, collocated with a construction team to have continued conversations so not only can they get the system of record kind of things, but also get that local, you know, knowledge for those things that aren't as obvious.

Q. Right. Right. Well, so, and that brings me to -- you know, and just one follow up here and I promise I'm getting to the end of my questions here. Okay. So, you know, imagine you're an engineer and you've got a project. I mean, what is going to make you think of sensing lines? You know, because I wonder about, you know, even if that information had been there -- let's just play devil's advocate, you know, about the sensing lines.

Let's say that had been updated in the system -- which I think is a great thing, obviously. There's no question about that. But, you know, what would make them know to look for it, or would it be evident? If it had -- if sensing lines had been in the GIS system and you would open that file, would it have been, oh, you know, there's the sensing lines and it would have been apparent, you know, to respond?

A. Maybe the parallel I can give you to help with that, part of our steps are to identify equipment, things that are connected to the lines we're looking at retiring and replacing.

Q. Okay. Okay.

A. So, one of the steps in the engineer's process, and the most voluminous of those, are customer taps.

Q. Oh, okay. Okay.
A. So, when we replace, you know, cast iron with a new plastic main, one of the things you have to do in that process is move the customer's connection from the cast iron over to the new main. Otherwise, when you shut off and transfer flow to the new plastic line, those customers will be out of gas. We'll be getting hundreds of no-gas calls from those customers.
Q. Right. Right.
Q. So, part of the review is to identify all of the customers that are tapped off of the line being replaced.
Q. Okay.
A. So we've got an action plan in the sequence of events to move those taps from the old line to the new line. A sensing line, really, it's function is certainly different, but the physical components of a sensing line aren't that much different than a service line. There's a tap on the line, an essentially small diameter, 1-inch-type pipe running back to wherever it needs to go, whether it be a customer meter or, in this case, running back to a regulator station, to that regulator to help it control.

The fact that those records, you know, weren't readily available, you know, impacted recognizing that that connection was there, as I understand it. The other thing, you know, in our -- and we've changed -- we did very quickly put in what we call an operational notice. It's similar to some of the PHMSA things that come out that we're not quite changing code but we're going to let

you know here's something we found in the industry, some of them coming from your all's recommendations, as a highlight to say, hey, think about this.

We have a similar internal process called operational notices. We did that within days, really, of getting a sense of what happened there. We've since followed up with a -- just released last week a new gas standard, enhanced gas standard to really call attention to -- took what was in the operational notice and codified it for long-term in our standards and published it just last week, along with some other things that we felt were good improvement ideas that have come out in the last 3 or 4 months. But specifically around the sensing lines or the control line to make sure isometrics updated, it's current, we know where the sensing lines are at.

Q. Yeah.

A. It hadn't been as high a level emphasis because the -- and this was proven out for our low-pressure stations in this investigation of all, you know, 2,000 or so stations, all but a few; that the vast, vast majority of those are within the footprint of the station. They're not, you know, 30, 40, 50, 60 feet away on a main line out in the street. You know, as a company as a whole, you know, that was the exception.

I realize, you know -- and this is part of being a learning organization and continuous improvement and factoring it back in. So, you know, with going forward, that's where we were really

talking. You know, in addition to looking for those service lines that are tapped off the old main, now it's also, you know, highlighted to look for those control lines to see if they're on. Really, look at that main line to see if there's anything else tapped off of it.

Q. Yeah. Yeah. Yeah.

A. Not just customers, not just the sensing lines, but is there anything else that we don't expect or hadn't thought of tapped off the line before we retire it.

Q. Right. Right. Right. Tremendously helpful. Just a couple clarifying points. So, was this a -- would you describe this as an atypical configuration for sensing lines, or not so much?

A. For NiSource as a whole, yeah, it's atypical.

Q. Okay. Okay.

A. You know, with follow-up investigation, and this is really, you know, the after the fact --

Q. Right. Right.

A. -- come to realize there's some differences in regional and legacy practices.

Q. Okay. Okay.

A. That exist in Massachusetts compared to the, you know, the more Midwestern arena for the rest of our states.

Q. Oh, interesting. Interesting.

A. So, when you ask atypical, you know, that has to be put in the context of a population.

Q. Right. Right.
A. If you probably went to New England, you know, Gas Association, or Northeastern Gas Association and asked, they'd say, oh no, that probably happens quite a bit.
Q. Oh, okay. Okay. I gotcha.
A. You know, even, you know -- that's probably nothing to add there. But for my upgrading, you know, I physically resided in Virginia and even in New York. We used to have properties in New York in the '80s. I worked there. I don't recall it being even a thing there.
Q. Oh, okay
A. Having remote sensing lines.
Q. Yeah.
A. It could have been, but maybe it was just something I hadn't, you know, as the engineering leader, experienced in my 2 or 3 years there.
Q. Yeah.
A. But definitely not in the, you know, in the other Columbia companies. It's really a -- you know, if you were to ask me about Ohio, is this atypical for Ohio, I'd say definitely it's atypical for Ohio.
Q. Okay. Okay. I gotcha. I gotcha. And then again, because we're just kind of coming back to, you know, how we have a situation where this isn't really on somebody's radar, you know, and so I'm just wondering if, you know, if it's -- the

configuration would have potentially -- and I don't want you to speculate, but that's why I asked the question, so --

And then, okay, the last thing, you know, we had sort of talked about, okay, let's say, you know, this work package had been designed effectively. Would you be expecting that field engineer to, ideally to identify those sensing lines and be able to handle it, or would that be a different department? I'm just wondering was there a possibility that there was a miscommunication in terms of, you know, the meters and regulation department was supposed to do that and they were supposed to communicate it to engineering department, or does the engineering, you know --

A. I don't know that I can speculate going backwards. I can, you know, speak to it now, going forward. The identification of those during the inquiry for those is definitely on the shoulders of engineering to track down that information, now.

Q. Okay. Okay.

A. And we specifically -- as I mentioned earlier in our gas standard for tie-in planning, which is what we call sort of the MOC, you know, for a system, as we transfer facilities from, you know, one situation to another, it's on the shoulders of engineering to be the detective.

Q. Yeah. Okay.

A. To reach out. Look at documentation, but also do the reach out. And specifically with sensing lines, confirm that -- first,

you've got to identify which stations are in scope of the project.
Q. Yeah.
A. Which could be impacted. Because we've -- and by the way, we've -- when we put this -- took it from operational notice stage to our gas standard, we took it from just being low-pressure systems to this methodology, this expectation applies to all systems, all stations. To give you a sense of perspective, we've got, as I mentioned, around 2,000 low-pressure systems. We've got somewhere in the neighborhood of 10,000 total stations.
Q. Oh wow. Okay.
A. That are cutting pressure from higher pressure to some medium-pressure level.
Q. Yeah. Yeah.
A. So low pressure is already a minority and we're trying to phase it out, but it's going to take -- you know, we've got 6,000 miles of low-pressure main line.
Q. Wow. Okay.
A. Well, that's out of nearly 60,000 miles total.
Q. Okay. Okay.
A. So it's 10 percent or so of the system.
Q. Right.
A. Twenty percent of the regulator stations, 2,000 out of 10,000. Just because it takes more low-pressure stations. They can't push gas as far. That's one of the reasons it's better to have elevated pressure, because you can push gas through a system

farther at elevated pressure.
Q. Oh. Interesting.
A. Low pressure takes larger diameter and it can't deliver gas as far because you're dealing with inches water column, which is, you know, a quarter pound of pressure, a quarter to a half-pound range.
But to your question, you know, with our new gas standard and the identification of this as a very specific item that we're wanting to make sure we've got identified, it's on engineering to track it down. That'll be done with partners. You know, the system operations that manages those stations will be part of the input to that. But it'll be for engineering to make sure, before we move to the next step, that those have been identified and we have current information on them.
Q. Okay. Okay. I think I've got -- I mean, this is a tremendously helpful discussion. And, you know, I feel like I've got a little bit better of an understanding. So you've got an engineer, he's got a project, he's going to consult the GIS system, but then you've also got to have some expertise and know to, you know, reach out to some different groups and, you know, talk to who you need to talk to, to make sure you get all the pieces in place. You know, who are some people -- for example, I heard of a peer review. Is that a situation where you might have consulted a more senior engineer?
A. Yes. It's not as structured as our constructability review

process.
Q. Okay.
A. One of the other things, we've had a constructability review, you know, sort of an SOP, but it's not been built into our gas standards as more of a thou shalt. We've got a metric around it on the constructability review. The peer review is if it's a developing engineer, you know, that leader or that mentor buddy kind of person that they work with, you know, that can constitute a peer review.
Q. Right. Okay.
A. We don't have a formal, you know, checklist and here's the steps in the peer review and say now let's move from this stage to the next. It's less formal than that. As part of, you know, this overall -- the NTSB recommendation, you know, about constructability reviews, like I said, we've been doing them, but we're going to bring in another level of structure to it.
Q. Okay.
A. And we're actually developing a standard; it's in draft form. We're going to call it stakeholder review. And in that stakeholder review, there will be criteria for which projects you need to do these, but we're really looking along the lifecycle of a project at four milestones. That doesn't mean that's the only time people talk.
But one's a design review, which is closer to that peer review that you were mentioning, and that's, like, at the 30-

percent design stage of a project. I've pulled together the parameters of this project, I know I want to build it; I'm suggesting to build it out as high pressure or medium pressure or low pressure; here's the scope of it; I'm going to go with this kind of pipe and size. I haven't detailed it all out yet, but we'll sit down and, you know, have a group talk about it.

But the bread-and-butter projects that I mentioned earlier, just regular medium pressure, 30, 40 pounds, probably won't need that design review because they really are the normal parameters. But that one I mentioned that's a 720-pound high-pressure, you know, transmission-class pipeline we'll do the design review. Then there's a constructability review when you're further down, you know, the path of the design and it's 90 percent decided.

The third stage that we're going to have is a stakeholder review. This one's definitely newer from a structure perspective, but a pre-construction review. It's one thing to have the constructability review and that might be 6 months, even a year ahead of time when we're really going to build the project. But when it's close to time to build it, the engineer ought to be talking to the person that's actually going to be running the crew. So, we're going to institute that in a more structured manner as a pre-construction meeting.

And then the last stakeholder review that we're still trying to formulate is, after the construction, an operability review. Really, a turnover -- to use project management terminology, it's

really the turnover. The other term is evading me right now. But when you've completed a project and you're handing the keys over, you know, at the dealership to the new owner of the car.

Q. Yeah.

A. The same idea. When construction is finished, they've installed all the new pipes, they've tested it, it's in service, you know, as a last step, let's get operations out, on more complicated ones, to make sure that they know how it was installed and the unique characteristics about it. So, with our stakeholder review standard, we'll try to address not only the concept of the peer review or the design review and when it should apply and when it -- is it really necessary. The same thing with constructability review, pre-construction briefing and the operability review.

Q. Okay.

A. So, we do definitely have structure around a constructability review already, it's just not codified.

Q. Okay.

A. But we're going to go that next step and codify.

Q. I gotcha.

A. In fact, we've got build -- I mentioned our work management documentation management system has workflows?

Q. Um-hum.

A. We've got forms that we keep track of and count and determine, you know, what percentage level we're getting

constructability reviews done, when they need to be done, and crank out a metric every month and a list of projects that -- you know, and we're, you know, high in the 90-percent level of doing our constructability reviews when we require them already.

Q. Okay.

A. But we'll turn it into something even more, you know, tangible in the way of a gas standard.

Q. I gotcha. I gotcha. Well, you know, I appreciate the discussion. It sounds like, you know, you're both improving your recordkeeping but, you know, also kind of beefing up and adding a little bit more structure to these constructability reviews.

A. Right.

Q. Just kind of to beef up that process a little bit. So I'm going to hand it off to Anne after a brief --

A. Yes, I want to hear from Anne.

(Laughter.)

MS. GARCIA: Thank you, Mike.

DR. HOEPF: Sure.

BY MS. GARCIA:

Q. Okay, Kevin, I appreciate that you've given us a great deal of information in the, I guess it's over 2 hours of conversation you've had with Mike. And thank you for staying with us beyond the time that we anticipated. I'm going to try and keep all of my questions to some are summary, some are just capturing a couple facts that perhaps I didn't understand. So, if you could keep

your responses more to bullets?
A. Okay.
Q. Because we still have Steve and Roger.
A. I'll try. You elbow me if I'm not keeping it to bullets.
Q. Okay. So, what is the working title of the larger project that this was the work package of?
A. I don't recall.
Q. You don't know? Okay. What do you see as the specific purpose of this work package that was being performed?
A. As I mentioned earlier, it's replacement, modernization of our system through replacement of priority pipe. Replacement of priority pipe to modernize the system.
Q. Okay. And priority pipe would be?
A. Bare to cast iron.
Q. Okay.
A. Bare steel.
Q. So this particular work package that was being done on this day was to completely replace the old cast iron pipe with new plastic, or would you say it was to cap off the iron pipe?
A. Well, the cap off you just mentioned is just one step in a much longer project.
Q. I understand.
A. Okay. So there was a work package for the entirety of the project, and this was one step that they were executing.
Q. So the step that was being executed that day we had been

calling a work packet that this particular engineer had approved and gave to the construction people to do. Is that not correct?
A. Let me speak from a, you know, more generic perspective. The work package, when you say it to me, is for the entirety of the project. It could be from replacing, you know, a few dozen feet to a few thousand feet of pipe and moving service lines over, gassing up the new main, and then eventually, as one of the final steps in that work package, one work package for the whole thing, to cap off the old mains.
Q. Okay. So that we understand terminology, what then, in your terms, would you call the specific piece that this engineer was doing for that day?
A. The abandonment.
Q. Okay.
A. And, you know, within this broader work package there's one thing called a tie-in plan, and it's got enumerated steps. And one of those steps, you know, leads to the, eventually gets down to the capping of the, retirement of the old main.
Q. Okay. So, would you say that on this particular day, just prior to the incident, what they were doing was capping off the old --
A. They were retiring -- it was my understanding they were retiring the old main.
Q. Okay. All right. Thank you. So just in bullets, what would you -- and I know that you went over this in detail with Mike, so

I'm just looking for the bullets to make sure it's clear in my head. What would you expect to be the engineering review process for approving just what was being done that day, not the big, larger project? But you've got years and years with the company going through, so what would you expect that engineering review process to be that this engineer went through for capping off?
A. Well, there wasn't an isolated review just for that as a separate work package.
Q. Okay.
A. It's part of this overall tie-in plan that I mentioned that runs from installing the new main, gassing the new main up, moving the service lines over, to eventually one of the steps is the abandonment. So that's not a separate work package.
Q. Okay. This is very helpful. So the engineer, Louie, would not have had a separate package that he put forward in an engineering process just for this piece of capping off?
A. Correct. It's a subset of the overall plans.
Q. Okay. And at what level would that have been put forward for review? Would Louie have been the one to do it for the big, overarching plan?
A. Yes.
Q. So Louie was the engineer in charge of the big project of replacing thousands of feet of cast iron?
A. Correct.
Q. Thank you. So, where in that engineering review process of

the big project would the engineer verify the location and status of the sensing lines?
A. As I mentioned earlier, when they're reviewing the records and GIS and work management system and speaking with the other departments as they're planning this project.
Q. So in the early planning stage?
A. Yes.
Q. Okay. Thank you. And I realize that you answered some of these before.
A. That's fine.
Q. I'm just looking for the bullets. Was there a separate piece of work on that day or prior to the day, or possibly planned for afterwards, that was specifically for moving the sensing lines from the old cast iron pipe to the new plastic pipe?
A. Now you moved into specifics on that project, which up to this point I've been talking about the process generically.
Q. Right.
A. I don't know the answer to that question.
Q. Okay. That's fine. In a general process, would there have been a separate packet or work order given to a construction team for moving sensing lines?
A. As I mentioned earlier -- in fact, the word you and I talked about was atypical. So let me answer it this way: You know, as I talked about customer service lines, other attachments to the line to be abandoned, those are meant to be identified and then put

into the work plan to change those over.
Q. Okay.
A. So yes, there would -- you know, if identified, there would be a step either in the tie-in plan or a separate work order within the project, in the work packet that would be for moving facilities from the old line to the new line.
Q. Okay. And so, we could request that for this particular project?
A. I don't know about this particular project whether there is one or not separate for that sensing line.
Q. Okay. In general for a project, that's something that the NTSB would be able to request and you would know what we were requesting?
A. And again, it's either part of the tie-in plan as an identified step, if those exist, much like moving a customer service line over to the new main.
Q. Okay. Thank you. Where in the engineering process that you were discussing with Mike, at what bullet step, where would the risk assessment be done with Optimain?
A. Back at the beginning, the identification of the project, which leads to the prioritization.
Q. Okay. And would the engineering department do that? Is that part of the engineering process?
A. Yes.
Q. Okay. When there are changes in the type or scope of work

for the project or in the order of when the different work packets are being done, is there a loop back for an additional risk assessment to be done?

A. And here, when you're using the word risk assessment, it's different than the Optimain. I'm just trying to clarify, because now we're talking about not identification of the project but it's how to execute the project. But yeah, when a change in scope of a project happens, the construction team will come back and work with engineering to see if there's any impact.

Q. Good. And change of scope, would that include a change in the timing of the order? So if there was a stop work for a period of a week or a month for whatever reason --

A. Not necessarily.

Q. Or if there was a change like one piece of work had to be done out of the original order, would it loop back for additional risk assessment?

A. That could possibly -- if the order weren't changed around but just a delay, it wouldn't necessarily become a scope change to the engineer.

Q. Okay. So changing the order of the work, smaller work packets would be considered a change in scope and it would loop back for additional risk assessment?

A. It's possible that it could be. I'm not saying it universally is always.

Q. Okay, it might trigger it.

A. For example, if there's, you know, a hundred service lines that customers are served off of that, the order in which those hundred service lines are moved from the old main to the new main is not a change in scope that would impact the over all design of the project. I'm just giving you that example.
Q. Good. Good. But, for example, if the City said you can't work in this area of the city for right now for another 3 or 4 months and you had to do something else, work in a different area first, it changed the order when you could do things, that might trigger an additional risk assessment?
A. Not if the whole project were put on hold.
Q. Okay. Good.
A. Because it really doesn't change the sequence of events within an overall work package.
Q. Good. Thank you. And again, you went over the engineering process with Mike. And when is it that your field engineers interact with construction, where in the engineering process?
A. Throughout the design process. There's the informal relationship and data gathering that I mentioned. There's the milestone step at the constructability review.
Q. Okay. Thank you. And where or when in the work process do the field engineers interact with measurement and regulations?
A. The same concept as with the construction.
Q. Okay.
A. And there are measurement regulations involved with the

constructability because it's not on -- it's on every project that we recognize that there is an interplay between the construction project and the M&R station.

Q. Okay. So there's, just like with construction, there is an informal throughout?

A. Yes.

Q. And then there's also a formal milestone where M&R does a review and signoff?

A. It's a time before this. If that station is involved with the project, they would be part of the constructability review.

Q. So, what determines if they're involved with the project?

A. You have to look at each individual project to know whether it's in the vicinity of or has any impact on a station.

Q. Thank you.

A. You know, if -- okay. I would have moved on --

Q. I know, bullets.

A. I felt the elbow coming.

(Laughter.)

BY MS. GARCIA:

Q. In 2018, prior to the incident, was there a change in the M&R group, in their structure, in their purpose?

A. I'm not aware of -- I'm not close to that, so -- you know, it's a different department than the engineering group and more remote from, you know, what I know.

Q. Okay. So you didn't receive a briefing from anyone in M&R

about a change that they were doing in their structure or their procedures or --

A. Not that I know of or recall.

Q. Or the personnel level, that there was a cut in personnel level?

A. I'm not aware of any of that, no.

Q. Okay. Thank you. And then just a general question: What is your safety goal for the engineering group for NiSource?

A. Bullet points. Your goal is to design systems that are not only compliant but safe to build and safe for the public, improves our overall public safety.

Q. Thank you. And specifically, what is your safety goal in terms of what would you consider -- and I know that it's part of the risk assessment, but what is your safety goal in terms of an acceptable number of incidents?

A. Zero.

Q. Thank you. And the same would be for injuries, fatalities?

A. Zero.

Q. Okay. Thank you. I just wanted to get that on the record. And I appreciate that.

MS. GARCIA: So I'm going to turn it over to Steve now.

DR. JENNER: This is Steve Jenner.

BY DR. JENNER:

Q. We've really narrowed down our questions and I just have a couple I'm going to bounce around.

A. Okay.
Q. The process for the field engineer to gather information that he needs to develop a plan, how long does that process typically take? Is it days, weeks, months?
A. It now gets down to whether it's -- you know, I presume you're talking about cycle time, not the actual number of man hours, because they're working on multiple projects at a time.
Q. Okay.
A. And what I mean by cycle time, they might start gathering information and then they work, you know, a half a day on it this week, and then, you know, there are some inquiries that are out there that they don't get those answers back for a week or so. That would be a week's time versus a half-day's time.
Q. Okay.
A. You're talking about the cycle time.
Q. Fair enough.
A. More typically, it's in the weeks. And more complex might be in the months timeframe.
Q. Okay. A project such as this one that we're discussing, how long do you think, typically, that would take? Is that on the shorter end or longer end?
A. On the short end, weeks. On the longer end, 2 or 3 months. And if things start taking some longer time, are outside specifically design, it starts getting into the city and the permitting process and, you know, if there's conflicts with other,

potential conflicts with other utilities. You're getting those identified. You know, we go into a process of getting the telephone and the cable and the sewer to locate their facilities and mark them in the field, and those will take days to weeks, sometimes, to wait on that information to come back. And then the same thing with a permit, you know, knowing what the city requirements are for advanced planning and permitting. So that's what makes it variable. And there's some dead time. You know, it's not just straight work time.

Q. Sure. And a rough estimate of -- you mentioned that they would be working on multiple projects at the same time. What's a fair number of multiple projects?

A. I (indiscernible) to speak specifically to it, but when we look at engineering staffing, one of the things we do look at it is how many projects -- we've got, like I said, 3- to 4,000 projects, and I've got a couple hundred engineers, and that's on an annual basis. So it starts getting down to -- I don't want to do the math in my head but, you know, over a year's time, it's dozens of projects for an engineer.

Some of the projects will last over a 2-year period of time because we're trying to do the advanced planning now, you know, for 2020 projects. If we're still -- and some of the things we're finishing up for 2019, but you're really trying to also start looking ahead a year, and on more complicated projects maybe 2 years ahead. So they start overlapping with each other. It works

out well because there is -- like I said, you can't just sit down and for, you know, 3 days design a project.

Q. Right.

A. You've got to spread it out to gather, you know, information in between.

Q. Got it.

A. But it's not in the hundreds, it's in the, you know, the dozens-level that an engineer would be handling.

Q. Okay. We talked about level of competency or mastery. In general, how long would it take a field engineer to become competent or a master of his craft?

A. As I mentioned, we've got three -- four levels of the engineering job family: the two associate levels, 1 and 2, and then the field engineer. And that third level is the one where we all look to the engineer to be very competent in almost every arena of LDC design and engineering. The reason I say almost, there are some things that are -- like LNG plant facility or odorization, some things that just don't come up very often at all.

But for the things like we're talking about, you know, that mastery level for this kind of project, and then to be able to move on to a public improvement project, and then next time do a new business project, whether it be small or large, is -- typically, what we've been seeing is in the 3 to 4-year range to get to that third level.

But as I said earlier, it's not an all or nothing equation. There's certain types of work, different scopes of work. They're ready to go and do those kinds of projects in a few months. It might be 12, you know, 12 months. Others that are, you know, really unusual -- and, you know, looking back at the design and plan for this one, this isn't that unusual. Obviously, the circumstances that happened and followed up make it very unusual, but, you know, we do a lot of these kind of replacements across all seven states all the time.

Q. Okay. You talked about your expectations for the duties and responsibilities at the different levels that the project evolves from. If there is an omission such as failure to identify, to move sensing lines or service lines or something, is there any one of those levels of review that you would expect would catch this omission?

MR. TOBIN: You're not asking him to speculate, though?

BY DR. JENNER:

Q. Well, based on your expectations of their duties and responsibilities, would you expect any one of these levels to catch an omission, or is your expectation that they have different responsibilities that doesn't include detecting omissions?

A. Let me answer it back to the -- probably best to tie it back into the way I answered some of the questions you had around the level of granular, you know, review of a project; it really is with that engineer and the leader. Once it's beyond the leader,

you know, in this case, Dave Mueller or myself are not going to look at every project with that level of a microscope. I think that's the word we used earlier. So it really is at those first, you know, two levels. And the leader's level is again, it's going to come back to the level of mastery that that engineer has already demonstrated.

The other element of, you know, another review, and I think this is where you might have been going with the peer review, I think of it more as that mentor -- you know, if this engineer had already been working with a more tenured, developed engineer, the leader will probably count on that as a second set of eyes for that project.

Q. But I think I heard the peer review is very informal?

A. Correct.

Q. It's just knocking on someone's door and saying got a question for you, can you look at this?

A. And that's why I was tying it more back to the, you know, a very new engineer and, for this project, the leader recognized it was a development opportunity project. Either that leader or somebody else would have been, you know, identified to provide some guidance.

Q. Okay. You talked about some of the changes post incident. Was there any modifications to, like, the checklist item that we've seen in these packages?

A. As I mentioned, the gas standard around tie-in planning --

which the whole standard really is a checklist of think about this, make sure you do this -- was first published as an operational notice with the additional, you know, things to do, and now it's been codified, you know, in our gas standard and rolled out last week.

Q. Oh, just last week. Okay.

A. Yeah. I mean, in the interim, we've been working under the operational notice, so it was still in place. It just allowed us to formalize it long term.

Q. We had mentioned briefly Mr. Kulig. He's a professional engineer?

A. Yes.

Q. Okay. In your mind -- one of our recommendations, urgent recommendations was introducing a PE into the equation. Where do you think that would be -- I'm sure you've addressed it already with others, but do you have thoughts about where you specifically think that may be of value in terms of the project development?

A. Let me kick off with the fact that we have already introduced that type of urgent recommendation and started applying it across the footprint. There are some start-up challenges because it's certainly new to the industry. You know, states don't require that, but we're recognizing the value of the NTSB recommendation and trying to take advantage of that. And that comes under my, you know, oversight to get that up and running.

Q. Right.

A. Which we have. And we'll get better and better at it, you know, certainly, going forward to have that secondary -- the participation of the PE, you know, eventually, our goal is to have more and more saturation of PEs actually doing, you know, being -- with these field engineers, when they get to this third level, you know, if I could snap my fingers and try to align with, you know, the industry, where we're going, you know, I'd make that part of the advancement criteria.

But, you know, as I've learned, even though I am a PE and have been for 27 years or so, since I haven't had to utilize that registration very much, I'm learning a little more now about really the way that's exercised even in consulting firms. You know, the lead's more the PE. There's a lot of design engineers that aren't the PEs. Very similar, in a way, to our Marty Kulig and field engineer staffing.

I think it brings some more external credibility to it. I don't know that it'll change a huge amount. Let me flip it around because I'm -- obviously we missed something here. You know, this is what we're talking about. We wouldn't be here if it hadn't happened. But as you can tell, we do a lot of work every year and -- with a lot of engineers, and I'm pretty proud of the way they execute. So I don't think this is taking it from, you know, a problem to this is going to change the world. I think we're good and, you know, I can see this, you know, next step taking it to a, you know, even better spot. You know, the old Sears

commercial: Good, better and best.

Another thing that's borne out with -- right now we're using third party as a transitional augmentation, essentially, to our staff to get this done and provide some new perspective, as well, some new learning opportunities that we're taking advantage of. So I think there is some stepping stone, you know, advantages to this. I think it'll, like I said, raise credibility going forward. I don't think it'll be a remake of our design process.

Q. Great. I appreciate that. And just one last thing. I'll put a question in here eventually. Coming into this interview -- and again, we appreciate your time -- we had questions, I had a question about how easy it may be for anyone in a field engineer position to overlook such a low-frequency event such as moving sensing lines, okay? We had talked to him and he said, in his 4 years, he may not have come across having to do this before. So I'm thinking this is a low-frequency event. It's easy from a human performance standpoint to overlook something. So, how can we correct, you know, how can we elevate a low-frequency event so it captures someone's attention when it's time to do that?

What I think I heard from your discussion earlier is your approach is we're going to improve our GIS system and the available information so that he doesn't have to think about this low-frequency event, that it's going to be in front of his during his review; that the information will be readily, more readily available and that will help prompt his thinking along those

lines. My first question, did I capture that earlier discussion?
A. Yes, with one addition that in -- now at this one, low frequency but high consequence, you know, so high risk. Items identified, we have also built it back into not just documentation to GIS but in our standards as a reminder, you know, on the list of things to do that you've got to look for this.
Q. Right. That's a good word, the reminder. So that's the strategy you're using to -- through maps and through reminders and other cues for someone to think about this?
A. Correct.
Q. Great. Thank you very much.
DR. JENNER: Roger?
MR. EVANS: Yes. I'm sorry.
BY MR. EVANS:
Q. Just a few questions. First off, thanks, Kevin, for spending so much time with us. I'm sure you're pretty tired of being asked questions by now. I'll try and be brief.
So, the one thing I'm wondering about in all the discussions that we've had thus far, you know, when you look at the system and you look at the, you know, the great engineers working on all this, do you get some sort of a, you know, like a process description, a training session that says, you know, this is a low-pressure system, this is the sensing lines, the purpose of them is this? You know, this is how the gas is delivered to the homes; we have these components along the way. Is that part of

the curriculum, you know, for an engineer before he is allowed to even work on these projects?

A. Yes. Is that too much of a bullet point?

(Laughter.)

MR. SWIGER: I'm trying to get better. Would you like me to expand a little bit?

BY MR. EVANS:

Q. That's the short answer.

A. Yeah, in the training development program, you know, over that 3 or 4 years I mentioned -- and actually, the development program extends on to senior engineer, as well, which could be, you know, 7, 8, 9 years. But once you get to field engineer, which is the question that you had asked, Steve, around their mastering of the design process, after that, it starts evolving into some of the specialty areas or being that mentor for other engineers and taking on leadership of special projects.

So over that first, you know, couple years, especially for the things you asked about, that's definitely, you know, early on in their development. They are attending technical training classes in an environment like here. I don't know if you got a chance to go down the hallway and see the measurement regulation lab. Engineers will be in there. We try as much as possible to have them sitting in the same class that an M&R technician who's learning to actually physically do the work in the field. They'll be the, you know, the 12th person in the class. You know, there

will be 11 guys that that's what they're -- people, I should say, that are going to go out and work on those, and we'll have an engineer sitting right next to them learning the same way they do: put a wrench in hand and --

So they take several classes along that same line, which -- so they're physically getting their hands on the equipment and seeing what a control line or sensing line does for that, a pilot regulator, as well, orifices and that gamut.

Some of the more broader things you were talking about, a low-pressure system, a service line, main line and, you know, the broader elements of a system, in addition to what we do in the way of, you know, internal orientation for the engineer, they're also in their curriculum taking third-party classes online from GTI, Gas Technical Institute. There's a set of modules for new to the industry, and they're actually listed in here, that talk about what does a gas system look like. It's probably back 20 pages or so from that page.

So, yeah, that gives them that overall orientation of what -- because we've got new engineers who maybe didn't intern with us. Or if they did, they still take the same kind of training. You know, coming out of college that, you know, they know how to, you know, pass their fluid dynamics class, but they don't know how that applies to the gas industry. And we recognize that, that they need that foundation in a gas utility. I guess I gave you more than yes. Move on now.

Q. That's fine. So given that, what you just told me, you know, in a lot of industries they do a hazard analysis. They'll do, you know, what-if type situations or they'll do bow-tie or some sort of failure mode effect analysis or something like that, that says, okay, how can I violate MAOP on this system. And, you know, that would be like a checklist item you look at once you've done your design to see if your design is in fact, you know, not bulletproof but, you know, solid.

So is there anything like that that you folks use after a design is completed to say, okay, let's do somewhat of a hazard review on this system to see if there's any way that I can, you know, violate the maximum pressure for, you know, for the line, or, you know, something like that?

A. Yeah, along the lines I mentioned earlier around our design standards, the gas standards for designing a system. In addition to that, there are, you know, the checklists, which you probably already have, for the engineer to confirm that, yep, I've addressed this, this and this in the design. So the combination of those two things, you know, provide that guidance on all the things to consider as they're going through the design process.

You know, we certainly -- once we've -- and this is one of the interesting things, and I'll try to keep it short. But with the introduction, you asked about the professional engineer stamping and we're trying to use a third, you know, third party right now to provide a gap or transition step here. They're not

familiar with, you know, the NiSource standards and documentation. And it's made me reflect back on some of the things that we have figured out years ago and just built it into our standards. You know, what pressure is medium-density plastic pipe good for? We don't figure that out on every project every time. We do thousands of projects. That's already been figured out.

The PEs, this is why we need to work towards more of an internal -- the PEs from a third party are asking for that design basis detail that's already been baked right into our checklist, our documentation of how to build a pipeline. So that's why I do keep coming back to the standards, because it's more than just, you know, 192-type of information. It is actually how to build a pipeline.

So, you know, much of what you're talking about is there, and then we've consolidated, you know, some of that down as a reminder, a checklist, you know, for each package to say, yeah, I've thought about this, I thought about this, I thought about this, I've done that, is there environmental concerns, have I done the tie-in plan; what's the testing for this pipeline, to be both in the standards and, you know, in the checklist.

Q. Okay. Okay. So, when you discovered -- looking at the paperwork and stuff for this accident, I mean, was it -- and keep in mind, we don't blame, okay? Just keep that in mind, we're not trying to blame anyone. That's one of the things that we don't do. And, you know, we find out the facts because we want to share

the facts with others in the industry to prevent something like this, right? So, we're not looking to blame anybody. And this next question, I want you to keep that in mind.

When you looked at the documentation that surrounded this work package, was it obvious to you that, you know, the checklist hadn't been maybe followed in a concise manner, or maybe it had been skipped, or it was maybe someone with less experience was working on this than what you had hoped? Any things like that that you picked up on?

A. No. What we picked up on, including me, was, you know, the availability of that information. You know, the checklist, the design development process, you know, as I described it, was about collecting -- you know, reviewing the information around that system. And, you know, playing Monday morning quarterback, the process breakdown is the readily available information. This was still in a file cabinet rather than being in our core documentation system, you know, system of record.

Q. Okay. That's good enough. That's fine for that answer. I just wanted to, kind of wanted to touch on that. Okay, so I know you have Ohio, Kentucky, Pennsylvania, Maryland, Mississippi, Illinois -- or Massachusetts and Illinois and Indian; is that correct? Seven states, I believe?

A. Seven states. You broke up a little bit, but yeah. Ohio, Kentucky, PA, Pennsylvania, Maryland, Virginia, Massachusetts and Indiana.

Q. Massachusetts and Indiana. Okay. And do you have these low-pressure systems in all of those states?
A. Yes.
Q. Okay. All right. So the next question is, when we heard that you folks had done your due diligence with the GIS system and located all these sensing lines on your GIS system across your network, did the 20-odd-hundred include every single sensing line in NiSource, or did it -- was it just those that didn't have GIS representation?
I guess the simple question is, were all your DS lines off of GIS? They were not on GIS, is that correct?
A. That's correct.
Q. Okay. So throughout every state, the method that was used to reference the sensing lines, was it similar, a notebook, or was there something else that that other state had versus the way Massachusetts managed it?
A. The difference is in the other states the -- and this was borne out with our, you know -- including excavation of these identification where they're at -- the taps, the sense line, control line taps in the other states are really in tight proximity to the stations.
Q. Oh, okay.
A. And they're really on what you would think of as station piping rather than the main line out in the street.
Q. Okay.

A. So there hadn't been a need to put it in GIS -- identified need I should say. You know, we've obviously looked at that differently now. In the way we've documented them in GIS, if you think about the regulator station -- probably a better visual for all of you, and I'm not sure what your familiarity is with the equipment, but you've probably all seen an electric substation. You know, fenced in, corner lot, and there's wires and resisters and controllers and all kind of things. A regulator station is a small version of that, and there's a lot of smaller-diameter piping and control tubing and those kind of things that are right in the station.

And in Massachusetts, we've got this example and it's, you know, more common -- I mean, it's very atypical to the rest of the states where one of those tubes goes out beyond the footprint of the actual station. And that's what we've -- you know, the aha moment was, oh, we've got some of those, especially in Massachusetts. I think we found two in all of the other states that went beyond, you know, the obvious footprint of the station, whether it be a building, a fence, or just what looks to be the lot-lined area. Definitely not, you know, the norm by any means to go beyond the, you know, the sidewalk or the curb line in all those other stations.

So thinking about the complexity of the piping in the station, the way we've represented it is we've drawn a detailed isometric of that station and loaded it up into GIS. We had

station isometrics before, but they were retained, you know, at the station, and they didn't have that level of detail. They did not have the control lines. It was basically a, you know, a schematic of the flow through the station at a broad sense, not down to a, like an electric -- if you think about electrical schematics you might have for a building that has -- if you ever open up and try to troubleshoot your dryer or something, they're hard to read.

Q. Right.

A. We had not documented it down to that level by showing, you know, the full route of control lines. That's what we've done with these 2,000-plus low-pressure stations, is drawn an isometric with that level of detail and stored it in GIS as a detailed drawing behind each one of those regulator stations. You click on it, open it up, and go to the drawing.

Q. Okay, let me make sure -- I'm going to repeat what you told me and I'm going to make sure I understand this. In Massachusetts particularly, the sensing lines were out beyond the footprint of the vault?

A. Yes.

Q. Multiple feet, I guess you're saying?

A. Yes.

Q. Whereas in the other states, those sensing lines were relatively close to the outline of the vault? They would be within the footprint of the vault; is that correct?

A. Whether it be a vault, a fence, or a building. The Massachusetts scenario, which is far less common, was a below-ground vault setting. Most of the NiSource stations are above ground.

Q. Oh, okay. Okay. Okay. So that's great. It's just great to know that. Okay, appreciate that. The one thing I want to make sure of that you stated just so I have this right, you said that the sensing line, the physical sensing line locations have been added to GIS, and you said VP Engine, 3-D GIS [sic] and Esri. What was the second one? What was the --

A. Oh, oh.

Q. I know what the other ones are, but what --

A. Yeah, I'm sorry if I made that confusing. I didn't mean to. There is one Esri, that's the software name, GIS tool, and that's the one that all the editing and updating and tracking is done in, but it's quite complex. So it is not the one that you would use for just a person viewing the geographical information.

So we have one called 3GIS that's very similar in some behaviors to, like, Google Maps. If you would think about Google Maps, when you go into Google Maps, you can zoom in and zoom out, do searches, but you know behind that there's some engine driving that. There's some edit capabilities to maintain all of that data, and even more in our GIS system.

So that's why I mentioned there's two different levels of user interface. One is the core Esri GIS system, the other is

connected to the same database, it just serves it up in a simpler format called 3GIS. Then the third one I mentioned is called Arc Reader, and that's a disconnected version where you can hand somebody a DVD and it's got, you know, got their whole state's set of maps on it. So it allows them to look at it without having, you know, phone connection or sitting at one of our terminals in an office.

Q. Okay. Great. So those engineers that are working on similar projects today, they have at their disposal this GIS system and it does show the location of all the sensing lines and they can use that information?

A. Yes.

Q. And it's all been released to the engineers?

A. Yes.

Q. Okay. Great.

A. Just for clarification, you know, the project work, scope we're talking about is for the low-pressure 2,000-plus stations. As we go forward, it's a little less sensitive to it but, you know, we're going to, you know, expand that over time to be all of our stations that we have that same level of detail. There's just not as much risk with the elevated pressure stations because you've got the customer service regulator as another layer of protection for the customers.

Q. Okay. The other thing that I heard you say when you were speaking was that you had -- I didn't write down the number of

engineers, but you said I have this many engineers and we do about 2,000 or so projects a year. I'd like better numbers. I mean, I don't think I wrote this down right. What is a typical year for you as far as projects?

What I'm trying to get in the report is that you folks do thousands of projects a year and you do them safely, and this one happened to be one of this many thousand that you would do in a typical year. I'm trying to get the gist of that statement in the report so that -- and the factual document, so I can at least kind of have a yardstick for the reader as to the ratio of, you know, how many of these you do a year. A reader may think you do 20 projects in your group.

A. Yes.

Q. And you're doing thousands.

A. Yes.

Q. Maybe what I'll do is I'll do a doc request. That might be the best way to get the -- for an annual basis, between September the 13th of '17 to '18, how many projects did you do. I might do that. That would be readily available, right?

A. Yeah, it would be. And just for giving the immediate satisfaction, I pulled the data a few months ago for a 12-month period and it was 3500 job orders in the previous 12 months.

Q. And when you say that, those are transmission -- I mean, distribution-type piping projects, is that correct? ?

A. Yes. Correct. And I'm not counting individual service

lines. To get back to with a work order packet in, you were asking about he individual work order packets. This is at the project level. You know, within a project -- well, let me extrapolate it this way: 3500, you know, main line projects, and we replace associated to those projects 50-, 60,000 service lines a year. But I don't try to count those as separate entities. From an engineer's standpoint, they are, you know, children work orders to the project.

But, you know, 3500, you know, individual projects. We retire, you know, annually, somewhere around 400 miles of the priority pipe that I referred to. We've taken our total priority inventory from, you know, 9,000 miles down to 5,000 miles in the last decade. Yeah, it's a lot of work.

Back to your ratio you're talking about, there are a lot of projects flowing through, you know, those field engineers. And that's why we have such a large engineering organization, to really -- to drive those and make sure we're spending the right amount of time on each one.

Q. And just so I get this correct in the way I state this in the report, when you say 3500 projects in that calendar year, that is across all those states, correct?

A. Correct. That's not just Massachusetts, that's across seven states.

Q. Okay. All right. Okay. The next area I want to go into has to do with the over-pressurization protection discussions. I know

you've been with the company for -- I hope I wrote this down correctly -- about 37 years? Is that correct?

A. In June, it'll be 37, yes.

Q. Okay. Okay. So in your career at NiSource, do you recall there ever being discussions about over-pressurization protection with using snap-shuts or venting systems or anything like that? Where, you know, the project maybe got -- made its way up to feasibility and then, you know, it died on the vine and maybe it came back years later. I mean, I've been around this stuff and I know how projects come and go in companies. You know, sometimes you may plan something that costs several million dollars and something happens and you can't do the project.

What I'm just trying to figure out, was a snap-shut-type project, an over-pressurization prevention project, had you had one of those on the books, you know, through the years since you've been there?

A. Not that I'm aware of, no.

Q. Okay. And this is across all states?

A. Yes.

Q. Okay. Okay. I just wanted to ask that question. And then with regard to the snap-shut technology that you have put in place since the accident, you have implemented this across all seven states for all control lines; is that correct?

A. No. Let's separate the two things here. The control line identification and documentation and making it readily available

was one item, and we've nearly completed that. There's a handful in Massachusetts that we haven't. The other step you're referring to of putting in slam-shut devices as an additional level of over-pressure protection is just getting underway. That is a huge endeavor. The control line identification was a big effort. The introduction of another piece of equipment in every station and modifying the stations to accommodate it is really, really huge. When you're talking about doing a --

Q. As far as Massachusetts, is the work complete there, or no?

A. No, it is not. We're anticipating getting underway April 1st for that. You know, as I mentioned a couple times, we, in some jurisdictions, we've run into issues not being permitted to excavate and confirm where the control lines are at, and really wanted to get that further along before we tried to swap out, you know, equipment at a station with the slam-shuts. And then you've got he other variable that it's --

You talk about risk analysis and trying to make sure you weigh the pros and cons. Trying to do that kind of station work at these pressure regulator stations right at the time we're in peak winter operations and trying to, you know, keep homes heated, you know, doing that in January, February poses another risk. And rushing it too fast, you know, and the wrong time of year could create just as many problems as we're trying to solve. As well as the excavation issues, because in some case we'll have to do some excavation.

So we really -- we'd hoped to do more, originally proposed doing more of that, you know, in the first quarter, but the reality as you get into the design makes you rethink what the right solution is. Not that the solution changed but the timing got a little more realistic as we moved in to the early 2019. So it's not installed in Massachusetts, either.

Q. Right. And I can see you wouldn't want to introduce additional risk by going quickly with this one, because I can see that would be very, very difficult to put that in place. As far as -- so you start April 1st. Are you looking at completing the work in 2019? Do you know?

A. Still evaluating. For Massachusetts, to get in, you know, for the identified set of stations, yeah, that is the plan. For the balance, you know, the nearly 2,000 stations elsewhere, we're still trying to work out the logistics on that and get just as many systems protected, you know, customers protected as we can in 2019. But the reality is we'll probably need to prioritize where we can do the most early on and allow the schedule to really be realistic and balance the risk.

You know, again, you've all asked about that. We don't want to find ourselves in December trying to finish up and we're back into another cold weather type of period. So we're in the midst of really trying to work through probably half -- the sixth or seventh iteration of a plan to balance resources and equipment and design and fabrication that gets the most done in the right period

of time.
Q. All right. Okay. So anticipated for 2019, but not -- the confidence level may be off because you may run into issues and it may run into the spring of 2020 or something?
A. Yeah, for Massachusetts. For the other six states, it's still a bit of a bigger question mark as to what the duration will be. So I didn't want to mislead you. That's still a stretch goal, but we're not sure. We're certainly not absolutely committing to it because there's just so many unknowns. We've done one pilot replacement and trying to adjust our plan and scope of project to match up with what we learned in the pilot.
DR. HOEPF: Roger, can we pause for one second?
MR. EVANS: Sure.
(Off the record.)
(On the record.)
DR. HOEPF: Okay, we're back on the record.
BY MR. EVANS:
Q. Yeah, one last question. Kevin, as far as, you know, in your career, 37 years, have you seen any sort of a risk analysis or any sort of a report that said there was risks associated with sensing lines and do not do this, do not do that, watch this, watch that, we had this kind of a problem here, or this kind of problem here, where this topic made its way to, you know, risk analysis somewhere in your firm?
A. No. You know, again, it has to do with the proximity of the

control line to the station. You know, this was for NiSource, was a whole atypical.

Q. Okay. That's all I have.

MR. SWIGER: Yeah, from what I've seen with the industry, just to, I guess, cap that off, you know, with the reaction from the industry, I think they're seeing the same thing, that this is something that all of us are trying to adjust to, you know, this identified risk.

DR. HOEPF: Well, thank you so much.

MR. EVANS: Okay, thank you.

DR. HOEPF: Any final clarifying questions?

DR. JENNER: No, I'm set.

DR. HOEPF: Thank you so much, Kevin. We're going off the record.

(Whereupon, the interview was concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF:	MERRIMACK VALLEY RESIDENTIAL GAS FIRES AND EXPLOSIONS SEPTEMBER 13, 2018 Interview of Kevin Swiger
ACCIDENT NUMBER:	PLD18MR003
PLACE:	Gahanna, Ohio
DATE:	March 7, 2019

was held according to the record, and that this is the original, complete, true and accurate transcript which has been transcribed to the best of my skill and ability.

[redacted]
Lisa Fuerstenberg
Transcriber