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Mike: From the Center for Occupational Research and Development, welcome to Preparing Technicians for the Future of Work. I'm your host Mike Lesiecki. In each podcast we'll reach out to people who are actually on the front line of the future of work and hear what they have to say. That means interviews with industry, interviews with working technicians, forward thinkers in the field. We'll do some background research, and we'll curate that research to make sure you have the most up to date and relevant information. And in every episode, we'll suggest action that you can take. We want to inspire you to take that action.

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Our guest today is Phil Gilkes. He's the Regional Maintenance Manager for Dollar Tree's Distribution Centers in the continental US. So, tell our audience a bit more about yourself, and what your role is at Dollar Tree.

Phil: Yeah, thanks, Mike. I am the Regional Maintenance Manager for the eastern part of the US. I'm responsible for 11 of our 26 distribution centers. And all the equipment that's contained within those distribution centers. I have responsibility for a team of a little under 700 technicians that provide on-site maintenance to the distribution centers. And I've been with Dollar Tree around four years now.

In my previous career, I spent time (most of my time, to be honest) as a Field Service Leader working with manufacturers such as Siemens, and Intelligrated, which is now a part of Honeywell. I managed large field service

organizations supporting conveyor systems, sortation systems, and supply chain automation equipment around the country. I have a background in electrical engineering. And also I work very closely with the National Center for Supply Chain Automation, trying to find innovative ways of educating and developing technicians in our industry.

Mike: That's perfect, Phil. It's great to be talking to you about these things. How many stores does Dollar Tree have around the country?

Phil: We have just under 16,000 stores across the 48 states and five Canadian provinces.

Mike: You know, I'm talking to you now a little bit before Christmas of 2021. And it must have been a busy fall season for you in the supply chain world.

Phil: Yeah, it's been an interesting time, for sure. We're in a very interesting period, and we're having to adapt accordingly. Supply chains are stressed at the moment. And you know we're having to react to that as quickly as we can.

Mike: Now Phil, let me turn to this question for you. I'm sure you have a lot of experience in dealing with the workforce. As you think about that workforce, let's suppose, people that come into your organization or organization like yours. Do you see gaps in their skill sets? Do you say, "Boy, I wish they would have had more of this, or more of that?" What gaps do you see? And how do you know?

Phil: Well, good question, Mike. I think the first answer I have is, "How do I know that the gaps exist?" The reason I know is because, as a Regional Maintenance Manager, I'm part of the support structure for the technicians. And I'm also part of the escalation structure. And oftentimes I'm brought in or consulted on certain challenges that the technicians are facing.

And then, when I kind of lump those together, "What are the common aspects of that?" I often look at the Control Systems training, Programmable Logic Controller training, and associated components: sensors, encoders, and things of that type. Generally, mechanically, technicians are usually very adept as soon as they come into the organization. But they definitely lack the knowledge of Control Systems and PLCs.

Mike: Okay, Good. Now automation must be a strong "coming on" (if not already existent) issue. Does "increasing automation" increase the stress on the existing technicians? Do they feel compelled that they have to get up to speed on this right away? Sometimes people think of automation as making a technician's life easier. But does it make it harder in that way? What's your thought on that, Phil?

Phil: Well, I think it certainly makes their life different. I don't know that it makes it any easier. I do believe it adds a level of stress. Distribution centers, like many other facilities (whether they be factories or power stations, things like that), the equipment is critical to the operation in different ways across different industries. And, if that equipment fails or breaks down, there's a lot of pressure to return it to service very, very quickly. And with the added complexity that automation brings, I do believe that that adds some stress to the daily workload of the technicians. And more so because they may not have such an in-depth understanding of all the components of that automation. So, if it's a simple task that they understand, they can get through that very quickly and efficiently with the minimum amount of stress. But with the added complexity that PLCs and variable frequency drives bring to the table, that really does put pressure on them to perform. And I think most technicians are proud of what they do. And they like being able to fix things, and fix things quickly! And when they can't do that, I think it adds additional stress to their daily life.

Mike: It makes sense, Phil. I guess automation isn't a "be all and end all, and it's gonna cure everything." Rather, it's just a different way of doing things.

Let me ask you a follow-up question on that, Phil. We talked about the different skill sets that these technicians need. What about things like IT? Or cybersecurity? Or data science? You mentioned, you know, PLCs, and sensors and control systems. But what about those (I guess some people refer to them as) "cross-disciplinary skills?" How much does a supply chain technician need to know about cybersecurity, for example?

Phil: So, they're all very important, Mike. I think the good news is that technicians coming into the industry now are not necessarily intimidated by the technology. This

generation has been brought up with smartphones, and smart glasses, and advanced computing. So, they're not intimidated by the technology per se.

But what they lack is a general understanding of all the data that is being created in these automation systems. And how it can be used to help make the operation more efficient. More effective. Things like data analysis are very important. Understanding how to collate the data, analyze it, and develop some kind of trend that gives them some indication of how things are going. Are things getting better? Are they deteriorating? And if they're deteriorating, how quickly are they deteriorating? And that's where the data science piece comes into this. So, I think those skills are very important.

Mike: So, are they expected to recognize those trends in the data themselves? Or are there algorithms that flag those trends? How much does a technician have to know?

Phil: It's a little bit of both, Mike. On the more advanced systems that we have in place, there are algorithms that can detect those trends. But not all our facilities have brand new equipment, and that's where the technician has to be able to try and understand how the equipment's performing. So, they are expected to do some kind of trend analysis themselves. And it doesn't have to be super complicated. But how do you answer the question, "Are we doing better today than we were yesterday? Are we doing better today than we were last week?" And the only way you can really do that is by logging the data, and analyzing it, and applying a trend.

Mike: Speaking of measurements and metrics, Phil, a question a little bit off our direct topic today. But, does an organization like yours use something like Overall Equipment Effectiveness? Do you use some metric that everyone tracks?

Phil: So, personally, I'm a big fan of Overall Equipment Effectiveness. And the reason is, most technicians feel like, "If the equipment's running, then my job is done." And there's more to it than that! So, "Is it running?" Yes. "Is it running the way it should? The way it was designed? And finally, is it producing a quality output?" And those three components are what really drives that Overall Equipment Effectiveness. And I think that's an area where there are gaps. I don't think many Tech's fully understand

that. They feel, "If it is running, it's good, and their job is done." I think that's a "miss" across the industry, to be frank.

Mike: You know, Phil, it's an interesting story here. I was at a industry advisory board meeting at one college. And this topic of OEE (Overall Equipment Effectiveness) came up. And the industry guys and women on the board, were saying, "Oh, yeah. We use this all the time." And educator people were saying, "Well, what is this again?" So, I think you're right! There really is that gap there! And maybe that's something our project could help address going forward.

Phil: Yes, I believe so. I think it's very important. I think they'll be surprised, to be honest, if they perform that type of analysis to see exactly how effective or (more to the point) ineffective the equipment really is!

Mike: Sure. Phil, let's talk about Maintenance Strategies for a second. While characteristically, there has been schedule-based maintenance. But, of course, things have changed. What's your sense of the trends in Maintenance Strategy? Is it all going to Predictive Maintenance? How should technical colleges approach maintenance in their education programs? What's your thinking about that?

Phil: Good question, Mike. And I think, yes, it is going towards "Predictive." But the pace, I believe, is extremely slow. And there are a couple of reasons for that.

Implementing a Predictive strategy in a "green field" (a brand new facility with the latest technology) is relatively straightforward. It does require some additional artificial intelligence or some algorithms running in the background. But it's certainly easier to implement in a brand new facility.

The converse of that, though, is trying to transition from a Schedule-based Maintenance to Predictive in an older facility (or an existing facility) is a lot more challenging, and can be a lot more expensive. And that's really why the pace of this transition to Predictive, I think, is so slow. But it is the way to go, though.

Mike: Good thought on that. Speaking now of Maintenance in a general sense... It's clear to me, I think, that you would really value troubleshooting skills in your technicians. Do you do formal training when they come into your organization? Do you expect them to do troubleshooting? Do

you have a troubleshooting process that all of your techs
follow? What's your approach to troubleshooting?

Phil: Yes, first of all, it is extremely important. And yes, we
do provide training internally. Some of it is computer-
based. Some of it is hands-on. But I think there are some
core concepts of troubleshooting (of fault finding) that
can be taught prior to coming into the workforce.

And just some general logical thinking about "How something
should work. What makes it work? How do I test to determine
which part of this is not functioning properly? And then
how do I interpret those results and turn them into
corrective actions?" That in itself is a process. And that
CAN be taught at the community college level.

Then, when they come into the facility or into the industry
itself, that's where I feel that more specific technical
training can take place to develop their skills. But I
think they have to have that kind of logical thinking
"right from the get-go."

Mike: That makes sense, Phil. Of course, on top of that, there's
this sort of (Ha, I don't even know how to describe it,
but...) "Let's get this conveyor back online in the next 60
seconds!" Right? Because there's a lot of stuff going on
here. There's that additional pressure, right?

Phil: Yes. And that's something that I try and encourage all my
technicians: Don't panic. Think it through. Have the
fortitude to be able to take a step back, think it through,
and fix it properly, the first time 'round, rather than a
temporary fix that something's going to happen again. Or
when? You don't know "Where?" And it's always the most
disruptive time!

Mike: Good point, Phil. Let me change gears a little bit and ask
you, "Your thinking about certifications. There's a lot
happening out there in the certification world, both on the
industry side, the education side. But does industry really
value them?" That's the question. Are we going to see a job
posting someday, where it says, for example: "Certified
Industry 4.0 Associate preferred," or words to that effect,
Phil?

Phil: I think we are getting there, Mike. But right now, there
are a ton of certifications out there. As part of my role,
I do recruit a lot of new technicians and facility
managers. I don't see many resumes where candidates say

they have a particular certification. What I would say, though, is, "If I DID see a industry specific certification on a resume, that would get my attention! So, I don't think it's fully adopted yet by the industry because there is a proliferation of these certifications.

But again, with the National Center for Supply Chain Automation, they have a certification that's nationally recognized. It's portable. It gives the recipient of that certification, as some people put it, "currency" out there in the industry. But that one has been developed with industry leadership. And that one would get my attention if I saw that one on a resume.

But to your earlier point, I don't think it's widely recognized yet. But I think it will play a much more significant role in the future.

Mike: I appreciate the nod there to the National Supply Chain Center, Phil. I'm going to put a link to that Center and that certification in the Show Notes. So, thanks!

Follow up question. How do Dollar Tree technicians upskill? Do you use vendor training? Do you have internal training? How does it work?

Phil: So, I'm a big fan of giving technicians a career path. And so, we do internal training. And we also use trainers from the OEM manufacturers of the equipment. It's predominantly internal computer-based training. It does involve a series of lessons, followed by tests, and pre-tests, and post-tests, so that we can gauge "How were they before?" and "How did they perform afterwards?" And it's geared towards allowing them, not only to do their job, but to be able to progress to the next level. So, if they want to be considered for the next level technician status, then, if they can demonstrate that they've gone through the training, and they've reached the required standard, that should put them in a good position to progress.

And you have to understand as well that most employers in our industry, we don't let our technicians practice on the real thing. The equipment is too critical to our business to allow anyone to practice their skills on the production equipment. So, that's where a simulation (virtual reality, things like that) come into play. And they're useful tools. They can simulate very close to the real environment. And it's a low-risk and a low-stress way of developing the skills of these technicians.

Mike: That makes a lot of sense, Phil. As we wrap up today, let me ask you the following. If you had a crystal ball in front of you, right? What do you see evolving or changing in the next few years as new technologies come on? I mean, do you have great advice for educators out there that's going to help them prepare the students that emerge into the workforce of companies like Dollar Tree? Great advice? What do you see coming?

Phil: So, I see a trend, obviously, towards more automation, robotics, autonomous vehicles, drones even. And the tools available to technicians will change. I think they'll be moving away from the typical screwdriver-and-wrench type approach. It would be more to smart devices, virtual reality type displays, things such as that.

I think the good news there, though, is the new technology and the new tools—I think they're attractive to this generation of technicians. They've all been brought up in an era where computing and artificial intelligence has been developing very, very rapidly. As educators, we can keep an eye on those trends towards more automation and smart devices. And I think we'll win that battle.

Mike: We appreciate your insight there, Phil. You know, today, you just gave us a great perspective. It's very clear that you understand this technician workforce in this supply chain maintenance area very deeply. Your comments about the type of things they need to know. Everything in that range from control systems, PLCs, and sensors, to the more elaborate automation systems that are coming on. Very important.

And also, I thought, your comment that it's important to have a general understanding of how things work. And the understanding that they're trying to make it more efficient. More effective. And to using metrics like overall equipment effectiveness. Those are great messages for education and training programs out there, because we can shape those programs to try to meet industry needs.

And I think it's through working with people like you that we really can help move this workforce forward. So thank you, Phil. I really appreciate the comments today.

Phil: You're very welcome, Mike. Happy to contribute.

Mike: Alright, goodbye then.

Phil: Thank you.

Mike: Listeners, today we heard Phil talk about trends and transitions in the Supply Chain Automation industry. One of the things he mentioned was that it's not enough for a technician to simply confirm that a piece of equipment is operating. But rather, the expectation is to know more about its effectiveness and its efficiency. He mentioned that's often involved in a metric called OEE: Overall Equipment Effectiveness. And your first action for today is to upgrade your knowledge of OEE. There's an article for you linked in the Show Notes.

Phil also mentioned the topic of Predictive Maintenance. That is using information from embedded sensors and other smart devices to help the equipment to help the technician understand what maintenance issues are coming, and how to anticipate them before they cause problems. Make sure that your program or your own knowledge about Predictive Maintenance is up to date. There's a second link in the Show Notes that will help you do that.

I want to acknowledge that our podcast is produced by John Chamberlain at CORD. Thank you, John, for all the excellent work that you do. Our project is led by Principal Investigator Ann Claire Anderson, also at CORD. Thank you, Ann Claire for your leadership.

Now colleagues, I'd like to invite you, if you access this podcast via the website, to turn right towards the Show Notes and next to it is a link that says, "Feedback Survey." Take just a minute. Most people take less than two minutes to answer this survey. It'll help us improve the podcast going forward.

And finally, I would like to thank you, our listeners, for ***Preparing Technicians for the Future of Work!***

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