Jason, let's start with you. Can you walk us through exactly what FLISR is, its benefits, and how it contributes to the overall success of the Grid Transformation Plan?

FLISR stands for fault location, isolation, and service restoration. It's basically a software solution that uses the intelligent grid devices—all those smart reclosers that we have out in the field,—to automatically isolate the faults that, when faults occur, restore as many customers as quickly as possible.

The software itself has really complete awareness of our current real-time grid model and it makes decisions based on that data. So it's looking at the grid, looking at certain things such as voltage and where we have abnormals at, and trying to make decisions of how we can get customers on as quickly as possible.

And FLISR itself is really just a piece of the puzzle. It's really part of the whole GTP plan. You know, it'll make big differences, once we roll that out, into reducing customer outage times and making things better for us. But ultimately, without intelligent grid devices, the Grid Hardening program, and the Strategic Underground program, all these other aspects of the GTP, it can't be successful without all that stuff.

So, no, FLISR's a piece of the pie. It does make a big difference for us, but it's not the end-all of the game.

Thanks, Jason. Turning to you now, Aaron. I'd like to talk about the significance of intelligent grid devices. How do they work? And can you give us some examples of the technology currently deployed?

Sure. The intelligent grid devices we install as part of our IGD program, they're kinda simply the latest three-phase electronic reclosers and the line sensors that are part of our current distribution standard. One of the things that makes these devices so beneficial is our ability to communicate with them and to retrieve data.

And without getting into a terrible amount of detail, you know, a line sensor, it's simply a small device that essentially clips on the conductor you see on the top of the poles. It's, it's about the size of your fist, maybe, your two fists together. And these devices, their main purpose is really to provide fault information back to the operators or the folks in the field. But they're also capable of providing data such as current and voltage.

The more vintage version of that equipment, it required a human being to travel to the physical location. They visually, would inspect the device that would indicate whether a fault had occurred down line. And then, that information was used by the line worker to determine in which direction they needed to travel to patrol or look for trouble.

The modern version is able to provide this information remotely, using cellular technology. And like I said, it can provide other data points, as well. And the operators in the field can use this information to pinpoint the location of a fault more quickly.

The reclosers we install are much larger. You know, you think maybe even a, a very small car, the size of something like that, or a couch, and their primary function is to isolate problems on our system. So for example, a tree falls on the line, they're programmed to sense that rush of current that takes place

during a fault condition, and they have the ability to open, to break that electrical continuity and, in turn, isolate the damaged location from the rest of the system.

So, the more vintage version of these devices, they accomplish this through electromechanical technology, so there really wasn't much in the way of intelligence, in the actual devices. But the technology we use today is more advanced, and we're actually able to program electronic relays in the devices that can control each unit. And this opens up a whole new level of operability.

So not only can we program them to operate for faults in the way we want to, we can program them to operate in sequence on seeing the loss of voltage. And this is the basis of how our current version of distribution automation works, and those are called loop schemes for those that are familiar with it. And similar to the new sensors, we're able to communicate with these devices via cell modems and get real-time data from them.

So, now FLISR, we'll use these devices to take distribution automation to the next level with FLISR. It'll be able to take variables into account that we haven't been able to before, and it'll be a big benefit to our customers. So there's just this huge positive reliability impact, to installing these devices, and especially as their integrated with that FLISR platform.

And then, the one other big benefit, I think, that's worth recognizing with these devices, is we're able to get data from these devices continuously, and that gives us insight into how the system's performing. So, when you talk about being able to monitor the adoption of solar or other DER, you know, we're, we're better able to gain visibility into the distributioncy and see current flows, and how the voltage is being impacted by having this technology installed in the field the way we're doing it.

Talking about the data that is gonna be definitely coming in from the reclosers fence line sensors that are out there, FLISR's gonna be taking the data and and consuming that, and just using that to learn more and more about our grid.

So, I think as I referenced earlier, it's used in the current real-time model, so it's gonna be aware of when things happen such as faults and abnormals, when we made repairs that are not our normal scheme or normal scenario. And using that data, it's gonna be determined what's the best course of action when we have a problem.

And to Aaron's point, it's gonna be, when there's the right amount of voltage is at a certain point in time, and where we have load concerns at. And FLISR's gonna use all that data in times when we do have an issue, a storm for example, to make the best decision to get lights on for us, to get the most amount of customers on automatically, and moving away from the old loop scheme procedures we've had, which, to Aaron's point, require a lot of manual intervention.

Thank you both for those points. And it's just a great segue into discussing the next question, which I'm directing to both of you, Jason and Aaron. And that's, how does FLISR and intelligent grid devices, how do they work together?

I think Aaron kind of touched on this already. Basically using that cellular connection through the intelligent grid devices, it's gonna be, you know, feeding data back into our system, and FLISR will consume that data. And FLISR really has the ability to respond to fault locations through the reclosers and line sensors that Aaron referenced.

It looks for a way to isolate the rest of the affected circuit, using main line devices and restore as many customers as possible, using that data. The more main line devices that are at our circuits have at our FLISR, are intelligent, and has more to work with. The more, effected customers can be isolated and restored, the more data we have.

Intelligent grid devices, you know, could not be utilized under older distribution automation loop schemes because of engineering constraints, and for load and protection and coordination. So, a lot of information goes into play. And loop schemes require a lot of manual intervention, a lot of research.

And, to Aaron's point, earlier, a lot of field business to understand, you know, where certain protection schemes are at. FLISR's gonna have awareness of this. So they'll be aware of our real-time model, you know, our current amount of load, current real-time situations that we have, using that data to achieve better results. And just, get away from, you know, the manual intervention that loop scheme approach takes.

And don't fault loop schemes, they've done us a lot of good over time. But, you know, evolving, some FLISRs gonna allow us to have that current state data. And FLISR will make that decisions for us more productive, automatically, and get lights on faster.

Yeah and Jason really hit the nail on the head. I think FLISR is just, it's taking it to that next level. It's nothing, that... I mean, the loop schemes have served a great function, but we're looking to make that jump. And I think the two programs, of the intelligent grid device program, to me, is essentially an ablement arm for FLISR. I mean, in the placement of these devices, are what will allow us to get the most out of the FLISR platform.

So if we're strategically placing these in the places, or in the correct spots, we're able to, like Jason said, get the lights on quicker for more customers, and obviously, that's our fundamental goal here.

What challenges have you seen with these programs, and how have they been mitigated? Aaron?

For the IGD program, I mean, it's still relatively new, like so many of these programs that we are taking on as part of GTP. But similar of those programs, over the, the last couple years, as we've continued to ramp up, just the logistics of making that happen is not easy. You have to scope the work, design the work, secure material and the resources to build it. And that's the case for most all of these programs. And it takes a lot of effort by a lot of different groups. And we want to make sure we're being efficient and making the greatest impact, so-to-speak.

And there's been a lot of good work done by the grid resiliency team, and also by our partners in design and supply chain, the store room, the resource management. I'm really proud of our team and appreciate all the efforts from the greater team, if you will, to make this a success to this point.

And, as far as mitigating issues, I think a big part of it is just creating runway, meaning, you give each of these groups a vision of the volume of the work and then provide them enough time to get it done.

Yeah, Aaron, perfect explanation of, kinda, what we've seen as opportunities, essentially, or challenges, just another way of saying that. But, I think some of the challenges that we've seen on the software and technology side of it is really finding the right vendor, the right solution, that can satisfy the need.

Aaron talked about some of the challenge that he's recognized on that end, all the work it takes. It takes truly a village, to get this all done. It takes all of our partners to really make this work for us.

Working through supply chain issues, working to finding the right vendor, it takes a lot to get through those. I think we've gotten past a lot of hurdles, but we still have long runway ahead of us.

You think about, FLISR, is really kind of… almost essentially a tool of machine-learning. So, you're gonna have to train FLISR to understand what our model looks like. It has to have right data.

The biggest challenge I foresee coming, as we continue to go down this FLISR program, is data accuracy. Data has to be accurate. We have to make sure our JAS model is accurate, what we have in the field is accurate.

When we place a new device in the field, it has to be accurate, as well, too. Where it sits, how it's connected to our grid. Making sure that data comes back into our system, because FLISR's gonna need that accurate data to make those fact-based decisions.

If the underlying data's not correct, such as devices in the field, their settings, their locations, their voltages, FLISR can't make accurate decisions on, and how to react to power restorations.

FLISR will require timely quality information to Aaron's point, from design, construction. All these teams, you know, play a part into making sure that FLISR functions correctly and is truly successful.

What does success look like, rather, for both of these programs? Jason, and then Aaron.

Sure. Success to me, looks like, really, with FLISR, us developing a true self-healing and self-optimizing grid. It's gonna take a while to get there. Currently, these decisions require a lot of manual intervention, using our loop schemes field visits, a lot of research by the analyst and the regional operating centers. It takes a lot of effort to make sure we make the right decision, that loop schemes respond the way they should.

Success to me is getting to that true point where FLISR is making those decisions, using that fact-based data, and understanding what our grid looks like at a current time.

The deployment of solar and distributed generation is gonna make this difficult, without tools like FLISR and DERMS, things that we having coming out there. And integration of those systems to have the experience and the knowledge that we need.

But we can take a lot of the manual work off the ROCs, our field users to allow them to manage those 60,000 miles of distribution lines effectively, and make sure we're responding to customer needs, quickly.

My ultimate goal is to see limited-to-no interruptions for our customers, as a complete success. But it will take continued improvements of the GTP program, FLISR itself, and all these other projects that we have, to get us to where we need to be.

Yeah, and Jason, again, I think you hit the nail on the head. It's just all these programs and systems coming together. But I'd say a few things come to mind when I think of what, when we look back, what will you measure success. And I think for the IGD program, just first off what we want to make sure we

complete the work and the projects, safely. That's always gonna be paramount and, and almost goes without saying.

But, I would also say, success is simply just placing these devices in the most optimum locations, that we're able to get the most out of, the FLISR platform and get lights on quicker, and to more customers. And because of the ability to get data from these devices, I think success is, use this information we receive, to learn about the system and continue to improve proactively and prepare the system for things like, DEE or adoption.

(15:56):

I think when you look at these programs and how it fits within the greater grid transformation plan this is part of our efforts to set the system up for success over the long term. And even as we do this work, we want to make sure we're taking other program initiatives into account and the plans they have, and make sure it all kinda comes together efficiently. And if we can accomplish these things, then I think it's just a big win for everybody.

Aaron you made me think about one of things... You know, we previously talked about some of the challenges, but we also talked in the last question about success. I think one of the challenges that we're definitely overcoming each day, is ensuring that we are looking at this holistically. Meaning, all of our teams are working together for this one solution. Not just FLISR, but as a part of grid hardening.

All the other GT programs, we're making sure we're having clear communication, clear conversations to ensure that we're making the right decisions. If we don't work together consistently, on all these programs, have the right conversations as we move out, we're gonna fail. I think we're doing a great job of mitigating those, by having these kind of, forms of this, to share information and having the right conversations, bringing the right experts to the table.

So, what I see in the future is us continue to move forward with this program and all the other GT programs, along with just keeping the lights on for our customers, to be successful as a company. So I think that... I think we're doing a great job and I think I foresee success in the future of all these programs.