

Microgrids Rules

The Foundation for Future Microgrid Interconnection Standards

A Conversation with Mamadou Diong

Dominion Energy

May 12, 2020

Interviewee: Marty Rosenberg

VoE MfR #005

Q: Welcome to the Voices of Experience: Microgrids for Resiliency podcast. Voices of Experience is a US Department of Energy Advanced Grid Research Division initiative. It's meant to capture the experiences, insights, and lessons learned from utilities at the forefront of implementing emerging technologies. This podcast explores the key points of a virtual discussion recently led by Mamadou Diong who is an engineer with the

Distributed Generation Planning Operations of Dominion Energy. I am Marty Rosenberg, an energy journalist and host of this series. The topic we will discuss is the foundation for future microgrid interconnection standards. Welcome, Mamadou.

A: Thank you. Thank you, Marty.

Q: Diving right in, tell us where we are with integration of microgrids, where the standards are today, where they were in the past, and where you see them headed. Would you say this is still the early day, or are we right in the middle of it?

A: I believe we are right in the middle of it. We have a standard that talks about microgrids. It's not really a standard-- more like a guide. Actually, the Institute of Electronic Engineering is the one that put that standard together and provided some guidance on how microgrids should be built, but that standard is about at least 5 years old. It needs to be updated based on what we've learned. Right now, what I believe is we are right in the middle of doing more microgrids than we used to. It's picking up much more than it used to be. People want to have the possibility, that capability of staying off the grid when they need to but also not being restricted in a

microgrid mode, being in advance such as a storm. We feel like this is the best time to do it. We have to save money and be a little bit more in control of the area and how power is being dispatched. They can do that if they would like to.

Q: Just generally, microgrid integration standards-- are they fairly uniform across the utility, across the region, or across the whole country? If you went from the East Coast to the West Coast, are they still using the same set of standards?

A: That's the attempt that a lot of utilities try to do. That's why, a lot of time, they rely heavily on larger ambition and recognize across the United States actually. Generally speaking, they have this same similar kind of guidelines or process they go through in order to determine if a microgrid can be safely connected. When I say "similar"-- what kind of communication do you have? What kind of visibility do you have? Does it have the right protection in place? Does it hurt rather than the help the customer using it when they go into microgrid mode? Are they using the best utility practices in terms of protection? It's a standard that exists already that they pool into to make sure that everything is being done the

right way if I could say it that way. They have that in common. They are following industry practices, being lead by what other utilities have done successfully.

Q: Take a minute and talk about the distributive generation world that you deal with at Dominion Energy. What does it look like today, and where do you think it's headed?

A: The distributive generation world that I deal with, again, just like I said in my presentation, at the beginning, it started with a small-sized generation, maybe a few people who are venturing into that new business thinking they can make money out of it. Then, it starts to pick up, especially held by tax credits. There was a time where there were a lot of federal tax credits on top of the state tax credit that got people interested in building those. Nowadays, it's not all about tax credit. It doesn't matter if tax credit is there or not. People want to go green. They want to generation electricity in a clean way if I can say so. Make sure that they are carbon neutral or that they don't generate any carbon that could be harmful to the planet. What we're seeing is distributive generation is here to stay, especially solar and wind. They used to be very expensive to build 10 or more years ago. Now, they are getting much more affordable which gets people

interested in building those. It used to be that payback time or, let's say, the solar system could be years or a decade. Now, it's half it of it, just in a decade or so, it's about half of that time that you can get your money back and start making money.

Q: In your presentation, you put up a slide of the transmission at Dominion that's linked to 1000 megawatts of solar and wind with 3500 megawatts pending or more than tripling in the wings. Talk about that and why it's expanding so rapidly.

A: Well, it's expanding rapidly (1) because some of the mandates we're getting from the state jurisdiction, they want to move away from fossil fuels, and that pushes other utilities to start looking at ways to increase the penetration of those renewables. Dominion has about 2,640 megawatts of wind, offshore wind that they have currently pending in an application, and that's something that they want to build in the next few years. That's also a part of that 3,500 megawatts pending that we know at least two-thirds of it will come online at some point maybe by the end of the decade. Again, being environmentally responsible and having that sense of social responsibility is one of the things that is pushing the utility, not just

the state cooperation or the state jurisdiction, they are also helping us to start moving toward that trend where we have more DGs than what we have now. I can tell you already we used to have about 40% of oil generation and coal generation or more. Now, it's down to 15% or less of our total generation because of the desire to go away from any carbon-emitting generation, any generation that can cause human health and human life in general, yes.

Q: As you deal with this ramp up and as you try to rationalize the interconnection standards that you're applying to these microgrids, you've come up with 9 lessons that you shared in your round table, and I'd like to go over them with you. Why don't you tell us what each ones means to you and what you think the real significance of it is? Number 1-- you must have clearly defined engineering and technical standards and requirements.

A: Yes, that one is a very important one. It is a must, very clearly defined engineering standards. The reason I mention that is when we started with the DGs and with the small penetration of DG, we determined that we needed group standards and engineering standards, but at some point, some of the standards we were putting the books were engineering interpretations, I will say, if I can say that,

of how we should be tackling or how we should be reviewing some of those projects. Then, we realized that, okay, if you do that, you have to make sure it's based on current standards, something that's already in the book, and we found out that if we don't do that, you get a challenge everywhere by the developer, by the community or even the state jurisdiction on why you're asking them so many requirements and making the project so expensive.

Q: Moving along here, number 2-- building a team dedicated to DER studying and investing in the training and involvement in the industry.

A: That is one more like making sure that you have the in-house know-how and knowledge that you're building up. Again, you kind of just keep outsourcing the work that you're doing. At the end of the day, if you needed help right away, you may not get it quickly from an outside party. It's very important that you build the knowledge base into your company and invest into your employees so that they can get the right training to get to where they need to be to do the DER study including microgrid studies.

Q: Okay, number 3-- engage and get all stakeholders involved in the interconnection process.

A: That one, what I was trying to bring up is when we design

or we try to review a DER project, a DG project, there may be, for instance in my case, part of the DG and the planning operation side of the company, but operation is only one aspect of connecting and reviewing a project. There may be a metering that needs to review it and figure out or people on the operation side that need to understand or how connecting DG in a certain way and adding some devices will help them operate the system without having to sacrifice some important rule that they are using to keep everyone safe when we're generating electricity in their electrical system.

Q: Number 4-- ensure any interconnection requirements follow industry standards and best utility practices. That seems like a given, doesn't it?

A: That's actually, yeah, that's tied to the first one meaning that if you already defined those technical standards, not only are you giving clear guidance to whoever is trying to connect to your system, but you want to make sure that some of the standards you're referencing are following the best utility practices and industry standards. Most of the time, if you look at the state rules and procedures, they always reference some standard or some cause. That's what I'm trying to bring up here. Make sure you follow those

standards.

Q: While that's a given, I think the next one, number 5, is a little more subtle. Make interconnection practices and requirements a living document open to changes. What is that?

A: This particular one, what I was trying to say is when you get a document put together to help people, to tell the developer how you will be connecting to my system, it is important that you understand that technology advances. Things change over the years, so we have to be open to making changes, and maybe some old rules you had before may not be applicable today because technology has advanced enough to take into account. I had issues or concerns that you used to have that brought you to have some requirements, so you have to be open to change, and then, again, that will probably take you to the next one.

Q: I would link 6 and 7. Don't be afraid of taking a methodical approach to embracing, and 7, share and learn from others.

A: Exactly. In that particular one, what I was trying to say is, yes, be open to change, but I understand that sometimes change-- people may be afraid of change or how it could affect their work or maybe put them in a bind on how they

could maybe reject or both parts of change. It's okay to take time to do that change, to start embracing that change. Then, if you lack some knowledge/experience, you may just reach out to other people or other companies that may have dealt with those cases and learn from them. No one has all the knowledge. It's always good to try to learn and be humble and learn from others. It's not going to hurt you. Actually, it's going to help you a lot.

Q: Okay, number 8-- rely less on screens and more on detailed study.

A: There was a time period when we had very little penetration of DER. We knew from the get-go that if you have very small generation compared to how large and how strong the system is, that generation is almost like a drop in the water. It's not going to have an impact on safety of some parameters that you're looking into. Screens were the best way to move those projects past, but then once they create more and more penetration of those DGs, screens can no longer determine or help you think about if you may have an issue connecting one project to another. That's why it may be important to give up some of those screens and just go straight into the study and do the right-- that will allow you to do the right review and determine exactly what the

impact will be on your system.

Q: Okay, number 9, your last lesson-- trust engineering judgments when facing with unknowns and use a questioning attitude.

A: Exactly. That was also related to what I said. Again, you may not know everything about the implication of connecting this new microgrid design that you've never seen before, but as engineers, we learn to appreciate and understand that, okay, you do x, so you get the outcome y. If you have the feeling where engineering judgment is telling you, okay, there may be something we need further review, do it. Don't just be pressured by politics or other things that may tell you this is a high-profile project so just move it. No, take your time. If your engineering instinct tells you that you may need to pause and maybe sit on it a little bit, not sit on it to slow down everything or make things slow, no, but just trust your judgment. If you don't know anything or you're unsure about something, it's okay. It's the right thing to do to question some practices or something that may not be the right way to do it.

Q: Great. Thank you, Mamadou.

A: You're welcome.

Q: Thank you for the Voices of Experience: Microgrids for Resiliency podcast. For more information on the Voices of Experience initiative, please SmartGrid.gov. Subscribe and review the podcast on your favorite podcast platform.

Thank you and good day.

[End of recording]