



# Prabhat Jain

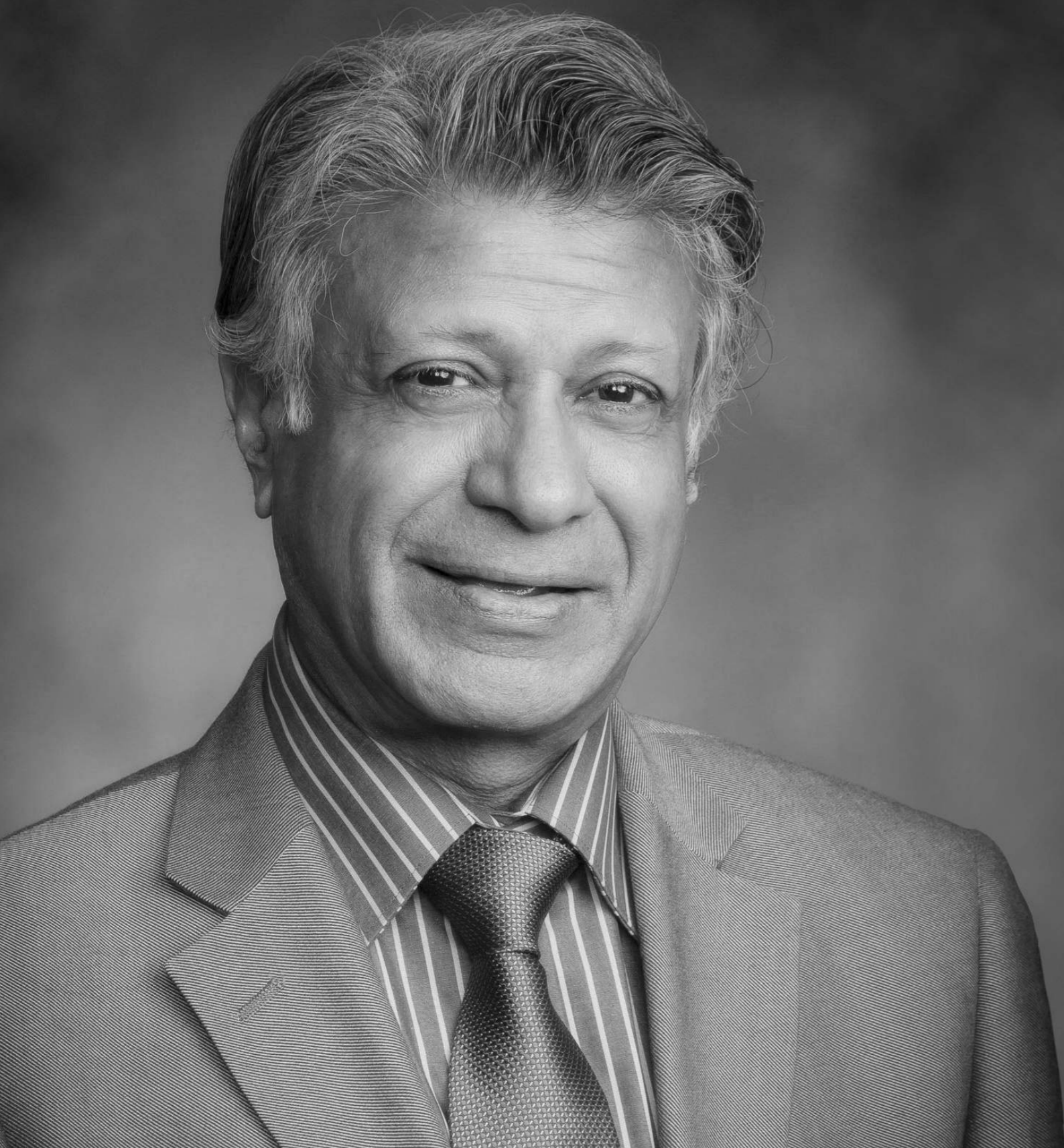


Photo: Prabhat Jain



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CEO-CTO of Virginia  
Transformer Corp

Interview with **Prabhat Jain**

**Alan Ross:** I have a guest today is one I've had many times before. Prabhat Jain is the CEO and the steering influencer of Virginia Transformer, Georgia Transformer. Prab, the first time we talked, it intrigued me so much because we were in the middle of the COVID supply chain issues. We also talked about a different approach to transformer manufacturing that was needed for all companies. It involves staffing, it involves technology, it involved a lot of areas that you have implemented at Virginia Transformers. Tell me a little bit about how things have developed since then.

**Prabhat Jain:** Alan, in our country, our biggest challenge is finding people, especially people who have STEM backgrounds. One of the things I have done is hire engineers just straight out of college and then utilize them more on the shop floor. That way, they are able to get their hands on the product. I have also transferred people from our Mexico plant to our plant here in the US. We've hired about 100 engineers from Mexico, and they have come to the US on what we call the TN visa. They are electromechanical engineers and they are working on the winding machines. They do an assembly of 500 MVA transformers and learn about a new state-of-the-art, highly automated, and sophisticated core-cutting machine that requires engineers to run it. We have also hired about 40 local engineers in our three US Plants. And in our Mexico plant, we have hired about 50 new engineers in the last six months. We are bringing more engineers onto the production floor.

At the same time, we started a program that we call EPI Three, which is Equivalent Proficiency Index Three. That means in one year, we get the person to become proficient, equivalent to a three-year person. It works like this: For six months out of the one year, they train full-time. We retrain them, reinforce, educate them, and then we actually have places where we build a transformer in an educational function. We have winding machines and actual transformers which are used for teaching people how to build a transformer. So they build it and we take it apart and build it again. Hands-on crimping and torquing and sealing, on a real product. Not the one that is going to be shipped to the customer, of course, but a practice product.

There are three prongs to this. One is to bring engineers on the floor and bring engineers from Mexico, because there are plenty of engineers available there. They progress from there to become technical leaders of the plant as technicians, quality engineers, process engineers etc. I've established a goal that 20% of the personnel in the manufacturing operation must be engineers and technicians. If I have 500

workers, and operators, I need 100 engineers on the floor. It's a realization after many years of saying, Why can't we improve our quality beyond where we were five years ago, three years ago? We reached a plateau of what we can do with the labor force available and how much we can train them. The next level to rise would be by engineers complementing the operators. This is my solution going forward, to continue to write the increase in our quality first pass yield, doing it right the first time, building the product correctly, and following the prints correctly. It's a huge investment in terms of personnel and in terms of management to oversee these personnel, but that is what it takes to ensure the quality of our custom-built transformers. Because not only does it give you better quality in the plant and a better product for the customer, but it is more satisfying for the people that work in the plant. That is the bigger benefit of this. Because they are successful, we are successful. They feel happy and satisfied. We haven't had a failure for the last hundred units. I started the project last year. This year we'll be getting some output, getting some traction, and making an impact on the quality continuously. And in the next three to five years, we will continue to rise up on that curve of quality. And over a period of time, I'm sure we're going to do even better.

I realized probably about two or three years ago that the demand for transformers with renewable energy battery storage and then data centers are going to be so huge that the supply simply isn't there. And there's going to be about 15 of those all over the world and of course, many others that are happening. There is so much demand for transformers and nobody is building up more capacity. Lead times are growing longer and longer. That's why I launched my plan.

The other project we launched is automation. I'm starting a robotic lab. We launched it last year. We have hired wonderful engineers. They go to school and do robotic engineering and we hire them straight from out of college. And these young people will give you all these ideas and projects to do fun things. We send them to the shop to start trying out stuff and see what

you can automate. So it's really a lab, and it's so exciting. I think in about two years, we would have some robotic applications in transformer making, which will be the first in the world. Very few robots are used in transformer making.

**AR** Everything you're talking about is really cutting-edge. I know transformer manufacturing very well, and we've gotten into this old mindset in the industry that that's the way we've always done it. And maybe they make minor changes here or there but you're talking about major changes. As an engineer, I would love to come to work for you, except I'm retired, so I can't. But we engineers have a passion for making things better.

**PJ** Yes, you certainly do. We have hired six PhDs in the last nine months. And you will be surprised but they are chemistry and physics PhDs. You would wonder why I would need chemistry and physics PhDs, but those are basic sciences. They will help me a lot, and they are solving problems. They are coming up with ideas on how to better cool the transformer, how to better secure the transformer against oxidation and then moisture generation. Scientists can do anything. Engineers can do anything. And you just have to give them a vision, let them loose, and they will go solve problems.

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**AR** I couldn't agree more. I want to go back to the plant you opened in Mexico, in Chihuahua, and I'm glad you said that it's not just a separate isolated thing but part of this collaborative project you have described. Why Chihuahua? When is it opening?

**PJ** I realized probably about two or three years ago that the demand for transformers with renewable energy battery storage and then data centers are going to be so huge that the supply simply isn't there. And then I estimated one time that we're going to be falling short on the pad-mounted transformers in the world by 20,000 transformers a year. And that's just a narrow estimate from what I could gather. And then nobody is putting up plants for pad-mounted transformers, at least in North America.



Photo: Virginia Transformer Corp



I also realized about a year ago, that we are decoupling from China and that decoupling from China would mean that we really have to do a lot of production at home. And then that production is going to be everything. It's going to be steel, cement, and paper, it's going to be pharmaceuticals, and then cars and batteries and semiconductors. So that's a huge push. This 40 billion semiconductor plant that Taiwan Semiconductor is putting in Arizona alone is going to require roughly \$300 million worth of transformers. There's a brand-new application because it wasn't there three years ago. There is the technology that is coming along on the energy side where they want to electrolysis, separate the hydrogen from water and they're going to combine it with carbon dioxide from the atmosphere and make synthetic fuel. there's. The first project of this going up in Texas, and it's going to require \$500 million worth of transformers in the next three years. Just that one project. And there's going to be about 15 of those all over the world and of course, many others that are happening. There is so much demand for transformers and nobody is building up more capacity. Lead times are growing longer and longer. That's why I launched this plan.

Initially, this plan was only to build small transformers because I saw that 20,000 shortage. However, I started to think about it, meet customers and listened to the energy specials and interviews of the CEOs that they do on Bloomberg. And I started realizing the demand for medium power and large power transformers in our country is going to grow because of the decoupling with China and the energy revolution. So we are really building the industrial infrastructure in our country to support the new manufacturing and the new energy demand. That is why we have launched this plan. It took somewhere around 15-16 months to build. It's amazing what they have been able to do in such a short time.

In addition to this small transformer, I then added a line in there for medium power. This is important because there are seven LNG terminals being built in our country right now, and each one of them requires \$500 million worth of transformers over a period of about seven to eight years.

It's all state-of-the-art: All the wiring is underground, and the piping is underground.

There is nothing overhead. Cranes can run freely everywhere. Everything is lifted by the crane by robotic platforms. You can move them with the remote control, and you can gear them anywhere you want them to go. They carry the transformer from one station to the other station for work. The plant is also fully air-conditioned. And it is only the second plant in North America that can boast that. Our Georgia factory is fully air-conditioned as well. That gives you a very dry, very reliable transformer insulation system. There was a company in Mexico, that was there for 70 - 80 years, and when they closed, we hired all their engineers. These were shop managers and manufacturers with 20 - 30 years of experience and we hired all of them and brought them to our plant.

In addition to this small transformer, I then added a line in there for medium power. We can build up 200 MVA in that plant now. 230 KV, 100 MVA. This is important because there are seven LNG terminals being built in our country right now, and each one of them requires \$500 million worth of transformers over a period of about seven to eight years. That is huge. Our new plant went into operation in October and the medium power line is already backlogged for 50 weeks. In just three months, we have gotten so much demand. So think about one thing: If this plant wasn't there, where would they get those transformers from?

**AR** The lead times would grow even longer.

**PJ** And what does this mean for the country, Alan? As a country, we wouldn't be able to do these projects. They would have to be postponed by one year. That means you hold back the progress for one year. I mean, that's the impact. So that's why I'm doing what I'm doing. So we can give you transformers now, so we can develop synthetic fuel now, so we can build our LNG terminals now to export the gas that we are now flaring in the atmosphere. We can keep that and convert it into liquid and then send it to Europe. They need gas over there.

**AR** Absolutely.

**PJ** This is what I've been able to do with these new plants. And my managers, the leaders of the company, know that it isn't just about building transformers and expanding our business. This is about helping our country to maintain and develop our infrastructure and become more self-reliant. That's so important.

**AR** I'm with you. Now, there's another side effect. You kind of mentioned it.



There was the Mexican plant that closed and all those people lost their jobs. Now they have jobs again. What is this doing in Chihuahua? It's got to be having such a positive impact on that community.

**PJ** The governor of the state, the mayor, and the secretary of the state, they're so energized by our design center. We have 200 engineers in the design center now over there. They say this is wonderful because not only are we giving jobs to the people who make harnesses because that's what most of the American plants do there, but we are building a real product there with real engineers. We do engineering there for us, the Mexican engineers are building products, and designing products for us. So the folks in Chihuahua are so energized. The leaders are saying this gives a big status to them. We created 600 new jobs in Chihuahua in the last six, or nine months. The standard of living in Chihuahua is rising so fast. They have a brand-new district now with shopping areas, cinemas, restaurants, and so forth because the standard of living has gone up so much in such a short time. And not only that, the education is so good. The engineers have respect for the company's process and they follow it. That's one thing I think they have an advantage over Americans. They follow the process. Because they have respect for the company, the managers, and the standard. I find that to be a differentiator.

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**AR** Everything that you said today you are completely right about. It's no longer a supply chain issue. It's a demand curve issue. The demand curve is changing far more

rapidly than we thought it was going to because we've been looking at where transformers are and not where they are going to have to be in the future. EV charging alone is going to change the demand curve. The transformer is the heart of the power system anywhere and we've got heart surgery going on because we have a lot of aging transformers that we've got to take out of service. They're going to fail catastrophically if we don't do something.

You got life cycle planning. You've got this demand curve increasing rapidly. But at the same time the need for quality. It seems to me you're addressing a lot of issues. When is the plant officially going to have a grand opening?

**PJ** We held a ribbon cutting ceremony on 10 February. It was really just to mark the event. Basically, the plant has already produced and shipped its first transformers. But on February 10, about 40 people from Virginia Transformers went down there to see and feel connected and be proud of what the extension of Virginia Transformers is. And of course, the local people were there, the officials like the mayor and secretary. Customers attended as well as our partners across our supply chain.

**AR** Make sure you get some really good pictures because I'm going to do a story on the grand opening and we're going to publish it because I would love to promote what you're doing. I think it's brilliant work.

**PJ** Absolutely. I think it's going to help our country a whole lot.

**AR** Prabhat, I love what you're doing. Everything you've talked about valuing people to create value for the marketplace. You are doing outstanding work.

**PJ** Thank you very much. I appreciate the opportunity to give my thoughts.