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October 15, 2024
GridTalk #425

DAN EGGERS INTERVIEW

Hi, and welcome to GridTalk. Today we're very pleased to have Dan Eggers with us. Dan is the Executive Vice President and Chief Financial Officer of Constellation and we're going to get into the heart of America's nuclear business with an interesting development.

Q: Hi, Dan. How are you?

A: Great. How are you? Thanks for having me.

Q: Well. We had to reach out and get you as soon as we could as soon as we heard that Three Mile Island, which was the site of our worst nuclear accident in the United States might be the site of its revival. You're planning to spend \$1.6 billion dollars to refurbish it and restart it on a fairly short timeline by 2028. Tell us why you came to that decision and what you think it signifies.

A: Yeah, so if you take a step back in time, Constellation Energy was separated from Exelon just under three years ago so we became our own company with all of the competitive assets from Exelon so all of the competitive generation and customer

supply and one of our core missions was advancing nuclear energy and clean energy and we had a view that job number one is to make sure that we didn't close any more plants and to protect the fleet that we have today. Second one was to find ways to add more capacity notably through operates who getting more energy out of the existing fleet, and the third is part of that would be looking at places where you could bring assets back and we saw and we're helping out with the work in Michigan to save the Palisades plant which Holtec now is going to restart which is a very exciting proposition, but in that exercise we went and looked at our fleet of assets that had closed arguably before their time but for economic pressures that we were facing last decade and TMI was clearly one of those candidates where it was a great running plant for a long number of years but the economics weren't there and as we saw the outlook for power demand growth rising mostly at that point in time through industrialization and electrification, the data economy probably wasn't there as it is today. We saw a need for a resource to come and that's what drew us back to look at TMI again.

Q: So, Dan, since you are the chief financial officer, let's get down to dollars and cents. You have one offtake customer for this, Microsoft who's agreed to take all of its power for 20

years. How central is that to making the business case for this revival?

A: It was for sure, critical. Microsoft has been a great partner of ours for a number of years working on a whole range of initiatives. They are undeniably a sustainability leader so when we realized that this was a viable project in the sense that we could bring it back from a mechanical and technical perspective, we brought the opportunity to them, explained what it could be and they were very enthusiastic. But we certainly needed a commercial contract at a level to cover not only the restart costs, the \$1.6 billion dollars you talked about but also to cover its ongoing costs which was had been the challenge which caused us to close it in 2019.

Q: So, let's just dive one step further. The Google's, the Microsoft's, the Amazon's of the world, they have huge needs now to power the Artificial Intelligence world and their data centers, and they've told me in interviews that money's no object. They're willing to pay anything they have to, to get sustainable energy because they're very profitable businesses. What can the rest of take away and what could others in the industry take away about the commercial viability of nuclear action customers like that today?

A: So, two things; one, they're great companies and money is no object, except for it is an object because it is very profitable. Also, so when you negotiate with them, the money is no object thing is, it's not quite as open as maybe it is in these conversations and so clearly we're working for commercial deals that work on both sides. I think that we're in a spot where the country's recognizing the need for nuclear, maintaining what we have and adding more popularity probably hasn't been higher for the technology on the polling indices so there is demand there. I think that when you look at any new, clean, firm, reliable energy source it is going to be more expensive than what's on the grid today on an admitting basis so finding customers who value all the components of that, right, so clean, reliable, firm, you can find customers like Microsoft who value all of those pieces right there, assets run 24/7. Our assets run 24/7. The need to pay for that then becomes part of the conversation and that was not a great discussion with Microsoft but with the Crane Clean Energy Center.

Q: There's so much I want to get to. Let's take one minute because we have a lot of utility industry folks listening in and talk about the genesis of the breakup of your assets from Exelon, just a few years ago, right? And with Exelon you had the largest utility in the United States covering, serving cities

like Baltimore, Chicago, Philadelphia, Washington, DC. With your assets, the generation assets, the energy assets, people need to understand that you own one quarter of the nuclear plants in the United States and in the half of the United States that has competitive energy markets, you serve close to 23% of the commercial and industrial loads so why was it important to Mr. Crane and the folks that ran Exelon to split this assets off and then let's talk about what you think that will allow you to do going forward.

A: Yeah, he was a really deliberate exercise to think about separating the company because to your point, we had industry-leading utilities on the franchises you talked about in great city environments, a great growth story, strong regulatory relationships on the competitive side of our assets and nuclear assets, commercial business, obviously all industry leaders and they were together and performing well but I think that we saw a couple of things going on. One was we didn't think that the pellet markets were valuing the company for the value of its pieces. Number two, I think that we had an opportunity for both businesses probably drive more with more concentration on their opportunities and that combination of the factors led to the separation. When I think about where Constellation is today and obviously we've seen a lot of opportunity come since the

separation has evolved, as the markets have evolved, increased value for nuclear assets through production tax credits is part of it, the IRA. Now, of the data economy and the demand for our resources getting more pronounced that we've had a really good environment for us and for us, the economy goes forward, how do we take advantage of these market needs and that's going to be things like reinvestment in the business. We bought 42% of the South Texas Project the nuclear plants in Texas a little over a year; year and a half ago, something like that. We have talked about nuclear upgrades at Byron and Braidwood's. We have the capital to reinvest in adding more megawatts there. We're able to do the Crane Clean Energy Center, the \$1.6 billion dollar gross spend there. And we've talked about the opportunities we look out to add upwards of 1,000 megawatts of additional nuclear capacity through operates across our fleet. Now we need to find commercial customers where that will make economic sense but there is a real opportunity there and I think our ability as a company both to have the resources to reinvest in those assets but also the focus to work with customers on these priorities is creating a lot of opportunity for us.

Q: So, to get into the weeds a little bit, let's go to Three Mile Island and you're going to be restoring turbines in the cooling systems to get up to 335 megawatts of output. What was

that unit originally designed to generate and I believe it's probably less than the original nameplate?

A: Right now, we're targeting back to where it was. Really, a lot of this is bringing it back to where the plant was operating in 2019 so if you take a step back, TMI was one of our best running plants in 2019. Its last fuel cycle, it ran breaker-to-breaker. It was a high performing asset when we closed. It closed for economic reasons, right; the cost of operating a single unit was too high to the market.

Q: But another way, could it be said that solar and wind were competitive and other cleaner sources were competitive?

A: I think we're in a world where you had some pretty heavy subsidization of renewables that were disrupting certain hours, particularly off-peak hours that were hurting baseload generation. Also, natural gas prices were probably in the \$2.00 in MCF range and that was weighing on the assets and we didn't have demand growth, so that combination hurt the assets plus nuclear assets were not receiving environmental attribute payments like embedded in the renewable deals and all that culminated in the pressures on TMI. If we juxtapose that against say Illinois where we had the ZEC Program or the CMC's later New York and New Jersey of the ZEC Programs where we saw the states double the value of the assets and the value of the attribute,

we were able to get additional payment for attribute, we were able to continue to operate those plants and they're still running today because of that.

Q: So, you're raising an important point which is the green aspect of nuclear power, which we'll get to in a bit but tell me first, when Three Mile Island was built originally, this unit was not designed to do 800 megawatts so it's probably larger, right?

Q: Well, there were two units originally, right so I think both of the units were probably rated to somewhere; I'd have to back and double-check to where it was on its original nameplate capacity. The 835 we're talking about is really a restoration to where it was in 2019. As we go through our work of the next couple of years to the restart, I think there's some opportunities we'll evaluate, maybe get some more megawatts out of the facility. We've got some work to do on the cooling towers. There might be a better, more efficient design to get a little more energy out of the plant.

Q: So, I was going to ask you since you're rebuilding, you can use new technology so when you say restore turbines and upgrade cooling systems, is it going to be a different plant, or are you basically going back to what it was originally?

Q: Well, first off, different plants are always being reinvested and I think my capital spend across our fleet is \$800 plus million dollars a year maintenance and reinvestments, right, so they're always being regenerated over their lives. When I look at TMI, we've made significant investments over time. Things like the steam generators were replaced in 2009 and 2011. Those were significant investments into that plant and I say that because you're always putting capital back in. When we think about the restart of Crane, we're really bringing it back to its original operating state with technology upgrades and safety upgrades where make sense. We're going to replace the main power transformers because they needed to be replaced given how they were laid up since 2019. We're going to do some work on the generators so we're comfortable there. The steam generators, we've done a very thorough analysis on and those are in good shape so I know we'll continue to get it back into condition but this is not a rebuild which is part of the reason why we're confident both in the cost to restart but also in the timeline to get it back online.

Q: So, perhaps to ask you an ill-formed question, the technologies that led to the meltdown of its sister plant in 1979, does that technology exist in this new plant or has it been eclipsed by generations of new improvements?

A: So, the reactor designs are similar by if you think about what has happened since that accident, right? That industry was a wakeup call and we talked about this when we announced the restart. It was a moment of deep reflection for the industry, the involvement, and the oversight of the NRC but also creation of organizations like INPO put a lot of governance and controls in place across the industry; a much higher level of accountability, training, performance tracking, and monitoring so we've made significant improvements in how we operate the assets. The accident at TMI was arguably and probably not even arguably, a human performance issue and so, we've learned a lot about the industry and we've gone a very long time with great performance. We've owned TMI Unit 1 and the RG Center since 1999. We ran it for 20 years. It ran incredibly well, safely, reliably, dependably over that time so I think we feel very confident, not only in that asset but in the entirety of our fleet continuing to run not only generally for their licenses at 60 years today but looking at 80 years and maybe even beyond when we think about the material condition of the assets.

Q: So, you're going to be doing work on the main power transformer out at the site, too.

A: Um hum.

Q: In a very non-technical way, tell us what is being done and why.

A: We are actually going to replace the main power transformers and they're actually on order right now and we'll get them delivered in 2026 so that's probably our single biggest capital item to get to restarting. Easiest answer is, Marty, that we closed the plant in 2019, we didn't lay-up all the equipment as if we expected to use it again and so the power transformers were left and the climate effect really caused some degradation. We are pretty confident that was going to be the case when we did our inspections. That validated which was the reason that we bought and ordered the new equipment which is coming for delivery. When I think about other pieces of major capital equipment, we've done extensive testing and analysis of them to make sure they were all in good condition or fixes that we make at our plants on a regular basis from a material issue perspective.

Q: So, during my due diligence here, of course I find the Union of Concern Scientists voicing concerns about the technological challenge.

A: Um hum.

Q: No one has done this before, taking a closed plant and reopened it. There are about 13 reactors that have been closed in a decade in the United States. You mentioned a few that might be prime for reopening; Palisades, Twin Arnold, Lanai is another one. What do you say to the Union of Concerned Scientists?

A: We run these plants day in and day out across a large plate of different technologies. We have a very good understanding of the mechanical and material condition of the assets. We've done this for a long time. TMI was laid up for a series of years; it was in very, very good shape when it went into that retirement period. It wasn't cannibalized or chopped up; no major equipment was removed. We've taken a lot of time and effort to send in not only our internal experts people who have experience in the plant or people who across our fleet who have very technical expertise in different areas. We brought in outside vendors to do analysis cause we weren't going to make this announcement; we weren't going to sign this deal with Microsoft where we didn't have extraordinarily high confidence in our ability to bring this plant back online. A lot of this, we talked about it on the announcement call, feels like a really big refueling outage and we're very good at doing them but a lot of it is going step-by-step, understanding each piece of equipment, what is its role? What is its role in the subsystem? What is its role in the

bigger system? To evaluate where we are and get each piece back together to make sure they're all functioning the way they're supposed to. We feel very comfortable with the amount of time we've put into it that this restart will make sense and we'll bring it back to how it was performing with upgrades and improvements and equipment where it makes sense and where it fits.

Q: So, we've looked back. Let's look forward now. There's a lot of interest in small modular reactors. We've had on GridTalk, the energy minister of Ontario, Canada and they were all gung-ho on bringing in those small modular reactors. I assume Microsoft being Microsoft, they looked at that option, they looked at this asset. Might you be bolting on small reactors at this site or at other sites as the leading U.S. nuclear utility owner?

A: It's a good question; there's nothing to break today, right?. Obviously Google had an announcement yesterday on an SMR deal. We helped work with Microsoft on the helium deal last year I guess. We've tried to help facilitate with different customers. I would say that it's certainly a technology we're excited about over an extended period of time. There's a lot of work the country has to do around licensing of the different technologies, establishing which ones have a valid path to

market and I think what's really important when you get into the SMR conversation is we need to get to the idea of what is at the prime? What is the time to deliver and what is going to be the cost of energy for one of these different reactor technologies and honestly, we don't know that today. We're at a place where we're probably so early for having a handle on first-of-kind cost, let alone end-of-kind and that is what customers in a lot of ways are working for so we're going to continue to put time and energy into helping the technologies develop. We serve as advisors to a bunch of the different technologies. We'll try and find ways to work with customers as they help to understand what they're looking for and we think a number of our sites are well setup for SMRs, right? If you think about our plants, they've been there for a long number of years in these communities. The people in these communities know these plants, they like the plants, they see the value of the jobs, the property taxes. They see the safety and the overall benefit of having nuclear in their communities. We think you have a good starting point for those early SMRs to be built near our sites or other nuclear sites to be honest. As it relates to the Crane site, it is known as Three Mile Island, it is on an island in the middle of a river so it is a little bit land constrained and I'm not sure

we'll see one get built there but it's certainly a possibility we'll evaluate over time.

Q: But what do you see as the next nuclear technology, and let's throw into the conversation, the experience of Vogtle and whether large units, you own a number of large units. Do you see new units with new technology that will really supersede what you have at Three Mile Island?

A: Yeah, it's a great question. I think that Southern's experience with Vogtle from what they talked about from Unit 3 to Unit 4 was a pretty meaningful improvement in cost and productivity and there's a lot of folks who are doing hard work to figure out if you were to keep on that trajectory, what could be the deliverable cost of a facility of that size? Where we are as a company, it's hard for our company to make a \$20, \$30 billion dollar investment that takes a long number of years to play just from an availability of capital and need to earn a return on it so I think that's probably not a place where you would look to see the Constellation necessarily play. I think that you need a large customer base. You need probably some syndication of risk amongst multiple owners to help reduce the individual exposure to building these large units today and maybe that's why the SMRs have become a little more attractive. The absolute dollars per unit will be less because they're

smaller. Ideally, you can get repetition and consistency in production of the facilities that you can have confidence in the deliverable cost of a little bit more than what you saw out of the AD1000 design.

Q: Since we're getting into bringing focus back into the nuclear sifter, we need to bring the notion of what happens to the long-term waste, and where's that stand, and are we any closer to having an ultimate repository for that waste?

A: We are not probably any further than we have been if you would have asked me this question five years ago or longer than that at this point in time. I think that what we have seen is great success in dry cask storage. We've been able to move the fuel out of the fuel pools into these cylindrical tubes, sometimes vertical, sometimes horizontal, that are able to store the fuel safely and dependably for 100 years, and some of the new technology's is getting to 400 and 500 years. Obviously, it's still an interim solution, it's not permanent but it gives you a lot of visibility and a lot of comfort that we have a place to store this fuel for a long period of time.

Q: Is Yucca Mountain just dead, or is that possible again?

A: I mean the politics have been hard as we've all seen. I think it's interesting to me when thinking about nuclear fuel and just bear with me a second when you think about all the

power that's been produced in the United States since the 1960s or '70s, since commercial nuclear power became available and it's been roughly 20% of our supply for a long time. Number one, we know where every gram of nuclear waste is today; it's all accounted for. By way of volume, if you put it all in one location, it would fit inside a super Walmart so when you think about 40, 50 years of all of our electricity, 20% of all of our electricity fitting that much waste in that small of space is incredible when you contrast that to the coal ash pond, it could be a 1,000 acres for one plant, and I think that's worth kind of appreciating because we know that. The other part when you think about the industry, is that we put away money, not only to deal with our spent fuel of money that's paid into the government or the ongoing expense of storing this in dry cask storage facility but we also set aside money to remediate all of the nuclear sites when they eventually retire to bring them back to greenfield and you've seen us do that with the ion plants already but we're the only energy technology where we set aside and reserve and actually not just reserve, we actually put money in a pension plan almost to make sure that each site is fully remediated at the end of its life and I think that's something that's pretty special about nuclear is the accountability we have from beginning to end of these assets.

Q: Since we have you here, I'd like to take you away from nuclear just for a second and talk about clean hydrogen and your involvement with the Midwest Alliance for Clean Carbon. What is that and what are you excited about there?

A: Yeah, there was a hydrogen hub network that we helped and are a member of and helped spearhead in the Midwest to take advantage of the hydrogen hubs laid out by the DOE through legislation and then the tax support, that would be the IRA through the 45V credit. We have a facility at one of our Upstate New York plants where we have a smaller test facility to demonstrate the ability to produce hydrogen at a plant and to find uses for at the plant to help create a use case for clean hydrogen. The Midwest was used to bring that to a larger scale, something we continue to work on, I'll save it the lack of resolution on how the tax credits will work to create and to produce clean hydrogen in the United States. There's a slow down the advancement of all the hubs. There's a lot of excitement a year or two years ago. It's just kind of gotten stymied with the uncertainty and hopefully, we'll get clarity out of Treasury and the DOE hopefully sometime soon, maybe toward the end of this year which will give us a more clear path of what the execution case could be for producing clean hydrogen across the country.

Q: Okay. Dan, this has been a great conversation. I'd like to take you to the 30,000-foot level for a moment.

A: Yeah.

Q: Constellation's the number one producer of carbon-free electricity in the United States. Of your 32,000+ megawatts of generation, 90% is carbon-free and your goal is to take it to 95% by 2030, 100% by 2040. We've seen some terrific hurricanes in the Southeast. We've seen summer after summer of major forest fires out West. As somebody's who's really integrated into the core of the electric generation system, how optimistic are you that the efforts we're making to take carbon out of our energy system will have a meaningful impact on climate change?

A: Well, there's a line in there and I think certainly we're optimistic and hopeful that decarbonization remains a path and tried and true solution for customers like Microsoft and others to decarbonize their consumption, time matching their energy use to carbon-free electricity every hour, we're optimistic about that. I think that to be honest right now with the growth and power demand that we're seeing in the United States with the data common usage and also the reindustrialization and other things, and we talked about this slower pace to get Union Nuclear online, I think that we have to honest, that gas generation is going to be part of our fleet for a long period of

time. It's going to be required to maintain reliability and to support the economic growth that the country is focused on. Doing our best to decarbonize and to find new ways to reduce the emissions of gas generation's important. Continuing down the path of closing coal plants is critical, so I think we have a big challenge ahead of us but I think there's got to be an awareness that all of this is incredibly urgent. If you're looking for gas to go away, we don't see that being the case anytime on the horizon.

Q: Do you think these reductions though are going to be impactful and hopefully produce the results we want?

A: I think we are in a great spot because we made decisions over a couple of decades to decarbonize our generation business. We exited coal a long time ago. We have a concentrated fleet of gas generation in Texas are probably the most efficient plants in the market so they're probably the least emitting of what's available. They're the most environmentally friendly in the sense of their air-cooled versus water-cooled. We've made a lot of environmental decisions in our fleet as a leader pushing toward decarbonization is important to us in helping our customers down that path. That in their transition, we believe it is a critical role for us. I just think that you also have to be honest that the world is going to use natural gas for an

extended period of time and we're going to need it to keep the system running.

Q: Thank you, Dan.

A: Thank you.

Q: We've run over but it's an important conversation and I'm grateful for you joining us.

A: Thank you for having me. It was a great conversation.

We've been talking to Dan Eggers, the Executive Vice President, and Chief Financial Officer of Constellation in Baltimore.

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