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Interview

18:30 02.06.2023

Head of the Westinghouse reactor business: almost every country realizes that decarbonization is not possible without nuclear energy

10 min read



The exclusive interview with David Durham, President, Energy Systems, Westinghouse Electric Company, to the Interfax-Ukraine news agency

Ukraine intends to build three new nuclear power plants by 2032 using AP1000 [pressurized water reactor – PWR], potentially bringing the number of PWRs to nine. Have locations been identified for these new facilities?

Yes, for the first one or two units, the Khmelnytsky site has been identified. And we actually signed two contracts for the first unit to enable us to start working on this unit.

What additional regulatory or technical work needs to be done before starting the project?

We have done some regulatory work supporting Energoatom. It is licensing work to provide for license changes for that site. And I believe those regulatory activities are ongoing with Ukraine's nuclear regulator. Once the regulatory work is completed, we will then undertake site specific design work that would allow the project to move forward.

A question about financing... Ukraine's Energy Ministry estimates the cost of building one PWR at \$5 billion. Do you anticipate drawing in any external financing for the project with Energoatom? Will U.S. Exim Bank, or other lenders provide financing mechanisms?

We did not participate in developing an estimate yet for the cost of a unit in Ukraine. We're not a Ukrainian construction company. And so that's a big part of the cost. However, that number you cited is not inconsistent with a study that was done last year by the Massachusetts Institute of Technology for the expected cost of an AP1000 [PWR] in the future in the United States, so it's roughly consistent. To the second part of the question, yes, we clearly anticipate supporting Energoatom in developing the financing package, if you will, that would include substantial support from the US Exim Bank.

We understand there's an MOU with the Ukrainian government to build up to 9 AP1000 units. Has Ukraine been reaching out to you maybe with the proposal to replace part of these bigger units for small modular reactors? Has there been any discussion of this?



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There certainly has been interest expressed by Ukraine to also pursue our AP 300 small modular reactor (SMR) in addition to the AP 1000 units, not to replace them.

There is no need to fight corruption. Conditions must be created to make its existence impossible - Danilov

Ukraine is feeding the world, it is in the common interest to ensure that Ukrainian agriculture quickly gets fully operational - Executive Director of UNEP

So, I understand that SMR technology for AP300 is undergoing certification in the United States and expect it to be completed by 2027. Is that correct? And if so, shall we assume that the first reactors will be launched in the United States? Are you talking with any other countries other than Ukraine to implement the SMR kind of technology?

Your statement about licensing for the AP300 SMR in the United States is correct. We targeted covering our design certification by the end of 2027. As to the location of the first AP300, that's really up to customers. We do not have to build the first unit in the United States, we could build the first unit in Ukraine. We are in discussions with several other customers, both in the United States and in other countries, including in Central and Eastern Europe, about potential AP300 SMRs. So, we envision that countries that are interested in the AP1000 but they will also be interested in the AP300, given that it uses the identical technology.

How do you see the competition for SMRs? How much competition is there? Are there identical technologies, or is there basically no competition because it is really a different technology?

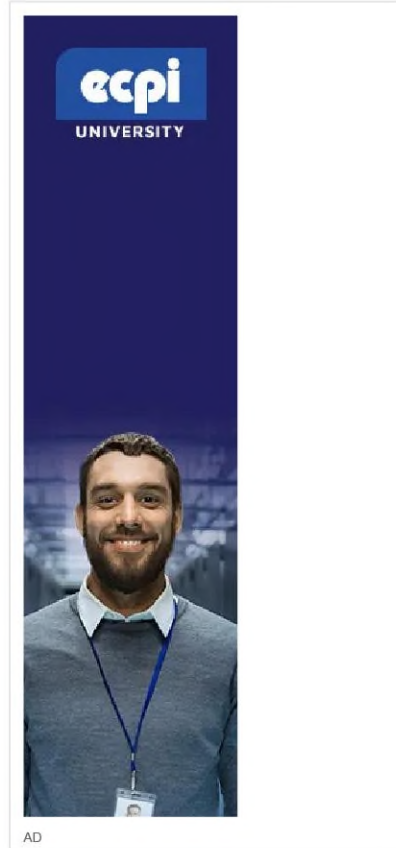
I could give a very long answer to this question. There are multiple different technologies being developed and promoted by various nuclear energy companies. Most of these companies have never built a reactor before. But they have very nice designs and they're smart people so they may be successful. But the fact that they've never done this before creates all sorts of challenges, which a company like Westinghouse has already gone through and can resolve. That's part of the answer. Second, if you look at the technologies that are out there, some of them, like the AP300, are light water reactors, they are very similar in concept to the reactors that operate all over the world now, including in Ukraine. So they're very well known. There may be different sizes and have different features. But it's the same basic technology. Some other SMRs, future generation SMRs, we think are still 20 or 30 years away from being fully developed and ready for market. They have other features that are very attractive, it's just they are truly first-of-a-kind technologies, which haven't been even developed yet, much less built.

If we talk about the fuel for the SMRs, or new units, are you going to use the Swedish facility to fabricate fuel? Are you going to expand the fuel supply for SMRs?

We have not made a final decision on where the fuel for our AP300 will be manufactured. We fortunately have several options. We have a fuel plant in Sweden, we have a fleet fuel plant in the United States. We have a fuel plant in the United Kingdom. And so you know, again, unlike all the other vendors who don't make fuel, we have several options that will largely be decided, as well as the supply and demand at each of those facilities and what makes the most sense for our customers.

Returning to the AP1000s, we understand that you already have an agreement in Poland to build from one to two for one to three AP 1000 units. I also understand that the process is ongoing for AP1000 technology in Bulgaria. Any other European countries or global countries that are that you're talking with?

Yes, there were actually several other countries. We do have an agreement for three units in Poland. We anticipate next year being awarded an additional three units in Poland. And



you are correct. We're in the process of finalizing arrangements for one to two new units in Bulgaria. We are also competing in a formal tender process for up to four units in Czech Republic. We're also in discussions in several other Central and Eastern European countries or future reactors as well. Slovenia, Slovakia... and obviously Ukraine. The United Kingdom is a very important market for us. So we see our projects in Ukraine, in Central and Eastern Europe, and a little bit in the western European market. It's a very significant market for us. Now we're starting to see it in Sweden and Finland as well. They have a number of programs, so those are also possible projects with the AP1000s, as well as the AP300. So, we are extremely focused on Central and Eastern Europe which is good for Ukraine and good for all the other countries in Central and Eastern Europe, because the construction companies and the suppliers can support all of the projects, not just the project in their country.

What is the specific role of Westinghouse in the AP1000 program? Is there anything else that Westinghouse will do in connection with this project other than transfer the technology? Are you going to be involved in engineering? Or maybe even construction of this? Can you tell us about the roles of Westinghouse and the Ukrainian side in this project?

We haven't negotiated every single detail. But generally, Westinghouse's role is to provide the technology, to provide the engineering and the equipment for the nuclear island. We can also provide the design for the turbine unit, if customers want it. Some customers would rather do it themselves. The construction will not be done by Westinghouse. In our agreement Energoatom will be responsible to select and manage the construction [companies]. We would support that. We have a lot of expertise and advice that we can give the construction [companies] on how to install equipment or things like that, about the actual construction that we need.

We know that the Westinghouse technology is used at the Zaporizhia Nuclear Power Plant, which is now occupied by Russia. Is Westinghouse considering any legal action against Russia for taking access to or control over Westinghouse technology?

I think we need a lot more information first. We don't have factual information that something like that has happened (accessing Westinghouse technology). But certainly if we were to obtain that sort of information, we will take whatever legal steps we possibly could to protect intellectual property.

Are you considering or are you in discussion with Ukraine regarding any remediation or assistance work for the Zaporizhia NPP, as soon as the plant is liberated? Do you know what you need to do? And are you talking with Ukraine in regard to the steps to be taken?

I believe that there have been high level general discussions. Absolutely. We would want to do whatever we can to help our Ukrainian customers and citizens in whatever work needs to be done at the Zaporizhia plant. As you know, we haven't even been to the site recently. So we don't really know what's been done or what needs to be done. Clearly we would be extremely interested in helping remedy whatever needs to be fixed.

What is Westinghouse's near term assessment for nuclear reactor market demand? How do you see that the demand will change over the year and in 20 or 30 years? What are the prospects for smaller reactors, medium reactors and large capacity reactors? What is your outlook on the future trend?

I would say the outlook is extremely positive for nuclear power. I think that the world is becoming increasingly committed to decarbonization and realizes, almost every country realizes, that you don't become decarbonized without substantial amounts of nuclear power. And nuclear is really the only option for substantial amounts of power. Renewables will be significant, but they cannot be the 100% source of our electricity. You will see all sizes of reactors, because they all have different benefits that they can bring. The large units, AP1000s, can provide, you know, up to 1200 megawatts, a large baseload source around large population centers or large industrial centers. SMRs are perfect for smaller communities or in large industrial applications. And then the eVinci microreactors, the small reactors, which produce five megawatts, are perfect for remote applications, for remote communities that are currently using diesel fuel, or for remote industries, for marine cargo ships that burn diesel fuel, for the oil and gas industry, for the chemical industry, for data centers, et cetera. The applications for microreactors are endless. Conservative projections are that hundreds and hundreds of new reactors will be built over the next 30 years. And I believe that will happen, I truly do.

When do you expect the licensing for the eVinci microreactor to be completed? In Westinghouse's portfolio it is my understanding there are three levels, three sizes of reactors, AP1000, AP300 and the eVinci microreactor. Is Westinghouse planning to expand its portfolio or maybe to stick with these three?

I think these three are the perfect sizes for 2027. The AP1000s available today. The AP300 and the eVinci microreactor will be available in 2027. Those three sizes seem to fit well with the market needs. However, we are working on generation IV reactors, thinking that 30 years down the road about reactors that have different characteristics, that are low pressure and are inherently even safer than the AP1000 and the AP300, which are the safest reactors. So we're constantly looking at the next generation of technology for the future. The three we have now are available today or just a few years from now. We think these are the right sizes.

Thank you very much for the interview.

My pleasure!

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