



Nuclear Industry Updates

NuScale Makes History with Filing for SMR Design Approval

Jan. 12, 2017—In a historic milestone toward the deployment of the next generation of advanced nuclear technology, Oregon-based NuScale Power LLC today delivered to the U.S. Nuclear Regulatory Commission a design certification application (DCA) for its small modular reactor (SMR) commercial power plant design. NuScale subsequently announced the filing at a downtown Washington, D.C., press conference at which five members of Congress, the U.S. Department of Energy’s undersecretary for science and energy, and NEI President and Chief Executive Officer Maria Korsnick all exuded excitement over the design’s potential to make the world better. “This is a dream come true for me as an early proponent of SMRs,” said U.S. Rep. Joe Wilson (R-S.C.) in remarks reflective of those made by the speakers. “The world’s demand for electricity and clean water will increase significantly over the next several decades. Our technology can meet that challenge with clean and reliable power, improving the environment and the quality of life for humankind,” NuScale Chairman and CEO John Hopkins said.

The 12,000-page application is the first ever to be submitted to the NRC for a small reactor. It moves NuScale a step closer to commercialization and construction of the nation’s first SMR plant. NuScale plans to build its first commercial power plant at DOE’s Idaho National Laboratory (INL). The plant will be owned by

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Aging Indian Point nuclear power plant to close by 2021

January 09, 2017-New York will be able to make up for lost electricity generation after the aging Indian Point nuclear power plant shuts down in 2021, Gov. Andrew Cuomo said Monday, announcing a deal between state officials and plant-owner Entergy Corp. that will close the facility by 2021. Sitting along the lower Hudson River about 30 miles north of New York City, Indian Point produces 2,000 megawatts of electrical power - an amount that the company says is the equivalent of a quarter of the power used in New York City and Westchester County. Cuomo has long called for the plant’s closure, saying operating a nuclear plant so close to a major population center is a potential safety hazard. "For 15 years, I have been deeply concerned by the continuing safety violations at Indian Point, especially given its location in the largest and most densely populated metropolitan region in the country," Cuomo said in a statement. "... The state is fully prepared to replace the power generated by the plant at a negligible cost to ratepayers." It will take some time, however, to ramp up other energy sources to take the place of Indian Point, according to Entergy President Bill Mohl. "Clearly right now they don't have the ability to replace the 2000 megawatts," he told The Associated Press. "Obviously they're going to need to add a substantial amount of capacity." Transmission upgrades and efficiency measures equaling more than 700 megawatts are already in-service, Cuomo said, adding that other generation resources ready to come online by 2021 will help generate more than enough

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the Utah Associated Municipal Power Systems' (UAMPS) Carbon Free Power Project and operated by Washington state-based utility Energy Northwest. It is expected to begin commercial operations by 2026.

"Today we celebrate a historic moment of innovation in the electric sector. On behalf of the entire nuclear energy industry I want to congratulate the NuScale team for its pioneering work," Korsnick said. "NuScale is a first mover in an exciting new technological frontier. We want more such innovation to follow."

The NuScale SMR consists of integrated pressurized water reactor modules, designed on the light water reactor technology

that has safely operated worldwide for the past 70 years. Each module's generating capacity is 50 megawatts-electric, and up to 12 modules can be "ganged" in a single power plant installation of 600 MW. SMRs have several advantages over their larger cousins. A power plant's capacity can be increased in stages depending on electricity demand.

Shorter construction timeframes—about 36 months for each module—can make it easier for a smaller utility to raise capital and allow quicker returns on investment while the rest of the plant is under construction. In addition, each module can be built at an off-site factory and shipped to the plant site via truck, train or barge.

The NuScale design, as conceived by the company's co-founder and chief technology officer, Jose Reyes, also has unique safety characteristics. Under abnormal conditions, the reactor can shut itself down and cool itself for indefinite periods without the need for human intervention, water addition or external electricity supplies, the company says.

Korsnick described NuScale's signal achievement as a "historic moment" in a continuum of developments and innovation in nuclear technology, all of which are necessary to ensure that nuclear power plants remain a vital part of the country's essential energy infrastructure. "The journey starts

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Aging Indian Point nuclear power plant to close by 2021

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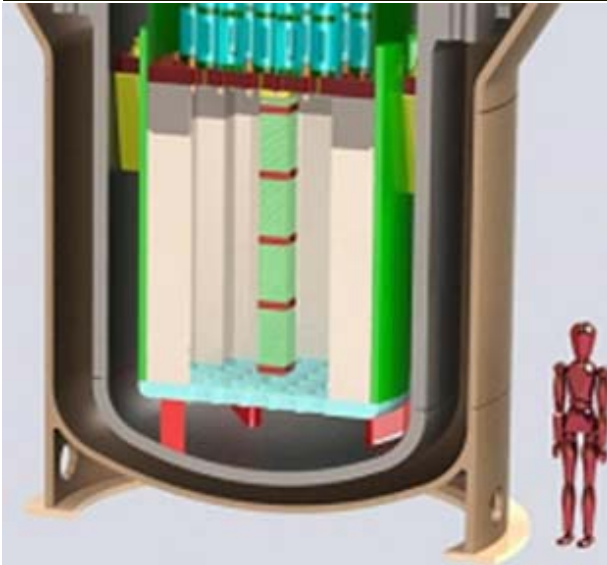
electrical power to replace Indian Point's capacity. In its announcement of the closure, Cuomo's administration wrote that "the plant's closure in 2021 will have little to no effect on New Yorkers' electricity bills." The plant's two reactors went online in 1974 and 1976. Mohl said increasing operational costs combined with low natural gas prices have cut into revenues, and that Entergy was facing a hard choice on the plant even before negotiations with the state began. "This decision was truly based on economics," he said. "We were going to have to make a decision regardless of the settlement with the state."

The agreement requires Entergy to make repairs and upgrades to Indian Point and its spent fuel storage system. It would give the state time to find an alternative source of electricity and allow the closure deadline to be delayed a few years if the state and Entergy agree. In exchange, the state and the environmental group Riverkeeper agree to drop legal challenges and the state will support the plant's request for a new federal operating license.

(DAVID KLEPPER, AP)

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with preservation of America's existing nuclear power plants, including second license renewal to allow today's plants to operate beyond 60 years. It proceeds through construction of more large light water reactors, like the four being built in Georgia and South Carolina," she said. "It further includes deployment of small modular light water reactors in the mid-2020s. And finally, development, demonstration and deployment of advanced nonlight-water reactors." NuScale has been working on its SMR design for more than 10 years, with initial development and testing at Oregon State University. In 2011, the global engineering, procurement and construction firm Fluor Corp. became the majority investor in NuScale. A list of the company's other major partners and investors is available on its website. "I'm very proud that Oregon has brought the United States one step closer to a clean energy future," said U.S. Rep. Kurt Schrader (D-Ore.).

The Department of Energy continues to play a crucial role in supporting the development of SMR designs. In 2013, DOE's public-private partnership program awarded NuScale with a five-year investment of \$217 million in matching funds to help the company with the engineering and testing needed to proceed through the NRC's design certification process. NuScale was the sole winner of the competitively bid second round of funding. NuScale has invested more than \$300 million of its own funding to develop the SMR design and the DCA to this point.

DOE Under Secretary Lynn Orr said NuScale's filing is "a big step along the way toward a future we very much want to support." A diversified portfolio of clean power sources must include nuclear energy, he said. "Today we are also celebrating the true success of public-private partnerships in innovation. These decisions clearly show a long-term vision in investment in our critical infrastructure and clean air technology," Korsnick said. "We want to celebrate more days like today."

The DCA is a complex document, supported by 18 technical reports and 15 topical reports. The NRC is expected to complete its certification process within 40 months. Once issued, a design certification is valid for 15 years in support of a combined license application (COLA) to construct and operate a power plant. In 2015, DOE awarded NuScale and UAMPS with a \$16.7 million grant as part of a three-year cooperative agreement to conduct site characterization activities at INL and prepare documentation leading to a COLA for a first plant at INL.

NuScale also has launched the Western Initiative for Nuclear, a broad collaboration of six states to study the demonstration and deployment of a series of NuScale SMR power plants in the Western United States.

(NEI / NUCLEAR ENERGY INSTITUTE)

Westinghouse Files for US Bankruptcy Protection

March 29, 2017 - Westinghouse filed for Chapter 11 protection from creditors today to enable strategic restructuring amid "financial and construction challenges" in its US AP1000 power plant projects. For its Japanese majority owner, Toshiba Corp, the move helps stem further liabilities from guarantees it provided its USA-based unit, which were \$9.8 billion as of December. Both companies stressed that only

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Westinghouse's US operations would be affected by the filing. José Emeterio Gutiérrez, Westinghouse's interim president and CEO, said: "Today, we have taken action to put Westinghouse on a path to resolve our AP1000 financial challenges while protecting our core businesses. We are focused on developing a plan of reorganization to emerge from Chapter 11 as a stronger company while continuing to be a global nuclear technology leader." Westinghouse, which made the filing at the US Bankruptcy Court for the Southern District of New York - said it has obtained \$800 million in debtor-in-possession (DIP) financing from a third-party lender to help fund and protect its core businesses during its reorganization. Toshiba said it would guarantee up to \$200 million of the financing for Westinghouse and that the Pittsburgh-headquartered company would be "deconsolidated" from its books, starting from the FY2016 full-year business results. Westinghouse's shares are split between Toshiba (87%), KazAtomProm (10%) and IHI Corporation (3%). KazAtomProm, Kazakhstan's state-run uranium producer, is entitled to sell its 10% equity holding in Westinghouse pursuant to put option agreements that can be exercised on or after 1 October, Toshiba said.

Westinghouse said the DIP financing will fund its core businesses of supporting operating plants, nuclear fuel and components manufacturing and engineering as well as decommissioning, decontamination, remediation and waste management as the company "works to reorganise around these strong business units". Existing letters of credit have been "cash collateralised in full and will remain in place", it said. The financing will also allow for new letters of credit to be issued.

Limited to USA - Toshiba, which bought Westinghouse in 2006, warned in December last year that it might have to write off "several billion" dollars because of Westinghouse's purchase in 2015 of US construction firm CB&I Stone & Webster (S&W). Upon closing of that transaction, Westinghouse assumed full responsibility for all AP1000 projects and the nuclear integrated services business. Since then, Toshiba and

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US Consortium Calls for Action on Waste

March 13, 2017 - A US business consortium has called for "decisive, swift and tangible" action on used nuclear fuel and high-level waste storage, including the re-establishment of the Office for Civilian Radioactive Waste Management (OCRWM) and re-engagement with the Yucca Mountain review process. The US Nuclear Infrastructure Council (USNIC) says the current "impasse" is costing US taxpayers billions of dollars. In more than 30 years since enactment of the US Nuclear Waste Policy Act (NWPA), and 18 years since the federal government failed to meet its statutory and contractual obligation to begin removing used fuel from nuclear energy reactor sites, the country's nuclear waste management program is in limbo "largely due to universally recognized political reasons", the USNIC Backend Working Group has found. As a result, there is no available disposal pathway for used fuel and high-level waste from both the commercial and defense sectors, with used fuel inventories in excess of 75,000 tons now in storage at operating and shutdown reactor sites. "This impasse is costing US taxpayers billions of dollars," the working group says in an issue brief published last week. It estimates current federal liabilities at about \$25 billion, with an \$11 billion increase since the Obama Administration's first moves to terminate the Yucca Mountain project.

Failure to "bring closure to the backend of the nuclear fuel cycle" has adversely impacted nuclear energy's potential role in the country's energy mix, the group said, with the lack of a disposal pathway cited as a factor behind barriers to securing funding for nuclear technology, licensing delays, and state-level bans or restrictions on new nuclear construction. "The continued stalemate is damaging America's international stand-

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ing on issues of nuclear safety, non-proliferation and security," it said. "It is crystal clear that decisive, swift and tangible action is needed to re-establish a comprehensive program to address the federal government's statutory and contractual obligations for disposition of growing inventories of [used] nuclear fuel and high-level waste - as well as to provide a path forward for the backend of the fuel cycle for currently operating reactors and pave the way for new nuclear energy plants required for US energy independence, jobs, exports, made-in-America clean energy leadership and national security," the group said. It recommends that program reforms are addressed through an "omnibus approach" including the Yucca Mountain project; consolidated interim storage solutions; management and funding reforms; transportation infrastructure; research and development of backend technologies such as recycling, to optimize the fuel cycle; and incentives for host communities.

Yucca Mountain reversal-Yucca Mountain, in Nevada, has since 1987 been named in the NWPA as the sole initial repository for disposal of the country's used nuclear fuel and high-level radioactive wastes. The DOE submitted a construction license application to the Nuclear Regulatory Commission (NRC) in 2008, but the US administration subsequently decided to abort the project, appointing a high-level Blue Ribbon Commission to come up with alternative strategies.

The USNIC working group called for the completion of the NRC's environmental and safety review of the Yucca Mountain license application to be completed and a final decision on whether or not to authorize construction of the repository to be made. It said this should include immediate action to re-establish the OCRWM. While the licensing process is being completed, consolidated interim storage solutions - with an emphasis on existing private-sector initiatives - should be pursued, the group said. "Consolidated storage is not a substitute for a permanent geologic repository but it does offer potential advantages as part of an integrated used fuel management system," it said. The private sector should also be used "to the maximum extent possible" to carry out work to ensure the availability of necessary infrastructure and capabilities for the transport of used fuel and high-level waste. "While the nuclear waste management program has been stymied for years in the executive and legislative branches of government, it cannot be allowed to remain so indefinitely ... It is time for the new Administration to join with Congress and re-establish the Nation's leadership role in the safe, peaceful and responsible use of nuclear energy," the report concludes. The USNIC is a business consortium that advocates for new nuclear and global engagement of the US nuclear supply chain.

(World Nuclear News)

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CB&I - S&W's former parent company - have been in dispute over the business's true value. Westinghouse is constructing eight AP1000 pressurized water reactors - four in the USA (two each at Vogtle and Summer) and four in China (two each at Sanmen and Haiyang) - with S&W as its consortium partner.

Sanmen unit 1 is expected to be the first AP1000 to begin operating, in September, and the other three Chinese AP1000s are scheduled to be in operation by the end of this year. The four US units are scheduled to start operations between 2019 and 2020. On 14 February, Toshiba said Westinghouse would be required to book a \$6.1 billion write down for cost overruns at Vogtle and Summer. The Summer units are being built for Scana Corporation's subsidiary South Carolina Electricity and Gas (SCE&G) and co-owner Santee Cooper, while the Vogtle units are for Georgia Power, a subsidiary of Southern Company. Construction of all four US AP1000s began in 2013. Westinghouse said today it had reached an agreement with each owner of the US AP1000 projects to continue these projects during an initial assessment period. Toshiba said such arrangements would contemplate that the owners would make payments for construction-related costs

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while the parties continue to explore and assess a comprehensive solution regarding the sites". Scana and Santee Cooper said today they had been working with Westinghouse in anticipation of the bankruptcy filing to reach an agreement, subject to bankruptcy court approval, that allows for work on the project to continue toward completion of the units. This agreement, filed today with the court as part of Westinghouse's bankruptcy filings, "will provide SCE&G and Santee Cooper the time necessary to perform due diligence related to cost and schedule. It gives us critical direct access to resources and information that Westinghouse had not provided us to date, which will be important as we plan for the future of the project," Lonnie Carter, Santee Cooper president and CEO, said.

Westinghouse said it "remains committed" to its AP1000 technology and will continue its existing projects in China as well as the pursuit of other potential projects in the future. Westinghouse's operations in its Asia and Europe, the Middle East and Africa regions are not impacted by the Chapter 11 filing, it said. Customers in those regions "will continue to receive the high-quality products and services they have come to expect in the usual course as the regions will also be supported by the DIP financing".

Toshiba has a 60% stake in NuGen, a joint venture with France's Engie, which plans to build a new nuclear power plant in Cumbria in the UK. Three AP1000s are proposed for the Moorside site.

NuGen said on 14 February that Toshiba was committed to Moorside despite announcing that day it would reduce its exposure to reactor construction projects outside Japan. Toshiba also said it would "consider participating in the Moorside project without taking on any risk from carrying out actual construction work". A NuGen representative said it was always NuGen's plan to identify an independent constructor.

UK regulators said last week they expect to complete the Generic Design Assessment of the AP1000 this month.

A NuGen spokesman said today: "NuGen will continue to work alongside our technology supplier, Westinghouse, and our shareholders, Toshiba and Engie, in taking forward the Moorside development phase.

"NuGen will continue in a 'business as usual' manner, working in collaboration to gain the appropriate permits and licences required to construct Europe's largest nuclear new build project, and will continue to increase value and attractiveness of the project to potential future investors, as we have always done."

NuGen separately announced today it no longer intends to submit a Development Consent Order application in the second quarter of this year.

The company spokesman said this was due to the high number of submissions received during the second stage of public consultation it had held on plans for the Moorside project that ended in July 2016.

"The extent of the changes to our proposals will determine to what degree the timeline for submission will change," the company said.

NuGen said its "ongoing evaluation" would take several months to complete, "followed by further dialogue to discuss any revisions".

"If there are any changes, which are outside the scope of NuGen's previous consultations, we will follow due process and engage with our stakeholders on these changes. More importantly, NuGen is taking full advantage of this opportunity to evaluate its design choices in parallel with the feedback from the second stage of its public consultation to make sure the project can be delivered in the best way for Cumbria."

The NuGen spokesman said the reference to design choices "has nothing to do with" the reactor design.

(World Nuclear News)

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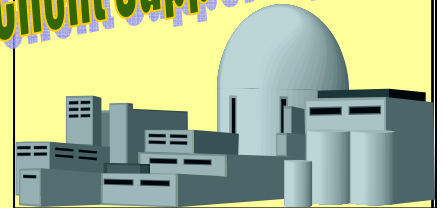
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The following key activities are being conducted by NWI professionals...

- Entergy's Grand Gulf Nuclear Station - OBE and Performance Improvement, Diagnostics
- Entergy's River Bend Station - Operations AOP/SDC Support
- Entergy's Arkansas Nuclear One - Work Management, Operations, Engineering and Nuclear Safety Culture/Performance Improvement Support.
- Entergy's Corporate Oversight/Functional Area Support, & Nuclear Sustainability Project
- EPRI's Switchyard Reliability Study OLM/Plant Support and Programs Engineering Guide Study

Client Support Update



Thank You

We wish to express special thanks to the following clients for making NWI a preferred consulting company.

- Entergy's Corporate Office
- Arkansas Nuclear One
- River Bend Station
- Grand Gulf Nuclear Station
- Electric Power Institute

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