

Q1. What is the current stage of development and licensing for small modular reactors (I am generally concerned with reactors producing less than 100 MWe) in the United States? When do you anticipate this technology to go into use? I am interested in both traditional lightwater reactors and reactors using alternative materials for cooling.

A1. On January 6, 2017, NuScale Power, LLC submitted a small modular reactor (SMR) design certification application to the NRC for review. On March 15, 2017, the NRC completed its acceptance review and docketed the application and developed a 6-Phase review schedule with public milestones that was transmitted to NuScale on May 22, 2017. The NRC has completed Phases 1 through 3 and is currently in Phase 4 of the review. The NRC is on track to complete the NuScale design certification review by September 2020 in accordance with the 42-month schedule established at the beginning of the review. The NRC public website provides information about the progress of the NuScale review at <https://www.nrc.gov/reactors/new-reactors/design-cert/nuscale.html>.

The NRC staff is currently engaged in pre-application activities with several designers of non-light water reactors. In general, the designers consider their specific deployment plans to be commercial proprietary information. The NRC public website provides information about the designers who have begun interactions with the NRC staff at <https://www.nrc.gov/reactors/new-reactors/advanced.html#preAppAct>.

Q2. Are there companies actively going through the licensing process for micro-reactors (those producing 1-20 MWe)? If so, is the licensing process different than it is for more conventional nuclear power? What timeline do you anticipate for the implementation of this technology?

A2. One of the companies currently engaged in pre-application activities with the NRC staff (Oklo, Inc.) is proposing a micro-reactor design. The licensing process would generally be the same for micro-reactors as for larger light-water reactors. The NRC has published a brochure regarding the licensing process for new nuclear power reactors at <https://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0468/index.html#intro>.

The timeline for implementation of this technology is uncertain and will be dependent on prospective applicant timelines for the development of technology supporting the future submission of license applications to the NRC. However, the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Section 327 requires that:

“Not later than 12 months after the date of enactment of the [NDA] Act, the Secretary [of Energy] shall develop and submit to the Committee on Armed Services and the Committee on Energy and Commerce in the House of Representatives and the Committee on Armed Services and the Committee on Energy and Natural Resources in the Senate a report describing the requirements for, and components of, a pilot program to provide resilience for critical national security infrastructure at Department of Defense facilities with high energy intensity and currently expensive utility rates and Department of Energy facilities by contracting with a commercial entity to site, construct, and operate

at least one licensed micro-reactor at a facility identified under the report by December 31, 2027.”

Under this pilot program, a micro-reactor could be licensed by the NRC, DOE, or DOD. This report is due by the end of August and will be made available to the public.

Q3. Finally, what can you tell me about the implementation of SMRs, including micro-reactors, internationally? Is anybody else using or planning to use this technology? If so, who is interested, what is your guess at the timeline of implementation, and what are the obstacles to its implementation? Any information on international companies developing SMRs is also helpful.

A3. Yes, other countries are developing SMRs, including micro-reactors. The International Atomic Energy Agency maintains a database with information about advanced reactor designs from many countries called the Advanced Reactors Information System (ARIS). The ARIS database is updated frequently with information supplied by designers and can be accessed at: <https://www.iaea.org/resources/databases/advanced-reactors-information-system-aris>.

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