Summary of Remarks
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"Opportunities in Reactor Technology and Fuel Cycle Technologies – Panel 2"
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NuScale Power General Design Configuration

NuScale Power is commercializing a modular, scalable, light water reactor based nuclear power plant. NuScale's standard design is for a 540 MWe plant consisting of 12 independent 45 MWe reactor modules and turbine-generator sets. Fundamentally, NuScale is addressing changes in the market which are calling for smaller up front construction costs and using engineering and construction techniques to achieve economies of scale that meet or beat other comparable thermal and alternative electric power plants. The design also addresses many factors needed in international applications. The reactor is cooled entirely by natural circulation and the steam generators are housed within the reactor pressure vessel. This design has eliminated the majority of the mechanical systems and emergency electrical power needed in large nuclear power plants. The combined reactor and containment vessel is 65'x14' and installed in a pool of water below ground level. NuScale is designing the system so that all components are manufactured off-site at existing facilities in the U.S. Prefabricated NuScale reactor modules will be shipped by rail, truck or barge. NuScale plants will use standard LWR fuel in assemblies approximately 6 feet in length. Spent fuel is stored conventionally in a spent fuel pool, then later transferred to on-site or transportation casks.

Opportunities for deploying Thorium fuel NuScale

While it has not been the focus of recent efforts, the use of thorium in the NuScale plant was briefly explored during studies in 2002-3. A thorium fuel core could be installed and, as expected, plutonium inventories in spent fuel would be reduced. Core design issues would arise due to the reduced delayed neutron fraction, with implications for control rod designs. In addition, new fuel areas would need to be designed for higher radiation levels. Even though these matters have not been explored in depth, we see no technical issues that would preclude the design and installation of a thorium fueled core in a NuScale plant. Opportunities might exist to conduct joint research with international partners in this field, should US policy move in this direction. Moreover, the opportunity to pursue such a venture in a small, modular design versus a large single dedicated plant might also lend unique benefits.

Changing Commercial Power Nuclear in the U.S. and the World

NuScale's fully modular and scalable construction qualities will help the U.S. meet its national energy and environmental policy goals as well as contribute to international power needs in the coming decades. Albeit with some implications to the overall commercial economics, a fully modular and scalable plant such as the NuScale design could provide an excellent platform, perhaps a preferred platform versus a dedicated plant to study new proliferation resistant fuel designs including Thorium-based fuels.