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Key Technological Challenges for Fission Reactors and What It Means for Fusion DAVID PETTI, Idaho National Laboratory — With the renaissance of nuclear technology around the globe, research is planned or underway to study advanced fission reactor concepts that offer economic benefits, enhanced safety, decreased proliferation risk, and reduced waste burden relative to the current generation of nuclear reactor systems as part of the DOE Generation IV and Global Nuclear Energy Partnership Programs. Much of the technology development in these fission systems is similar to those in fusion blanket and power conversion systems. Examples of the overlap in the areas of power conversion technologies, materials corrosion, welding and joining technologies, materials response under neutron irradiation, high temperature materials and coolants compatibility, first-principles materials modeling, materials design rules, and tritium/hydrogen behavior in materials will be given. The fusion community can help advance its technology development activities by actively engaging and leveraging much of the common cross-cutting research.

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