

Webinar Invite

Join us on April 5, 2023 8:30 a.m. EDT (UTC-4)

Overview of Nuclear Graphite R&D in Support of Advanced Reactors

As arguably the very first nuclear reactor core material, graphite has been utilized in a variety of nuclear applications since Enrico Fermi first stacked up bricks of graphite in a university squash court. But why? Graphite is not the first material that comes to mind when considering the extreme environment anticipated within a nuclear core. Materials with high strength, toughness, hermeticity, and hardness are traditional material choices for this demanding application. Graphite exhibits only moderate, or even low, values for these material properties. This presentation will address these issues and attempt to demonstrate that graphite is nearly the perfect material choice for these (Very) High Temperature Reactor designs. The latest information on graphite's unique crystal structure and bulk microstructure which provide the desired properties, the (baffling) irradiation behavior, the expected response to anticipated degradation, and how the nuclear graphite community is establishing the operational safety envelop of the core components within these new advanced reactor designs will be discussed. We'll finish up with a short demonstration of why nuclear graphite **cannot** burn (No, Chernobyl graphite fires did not happen).

Free webcast!



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Who should attend:

policymakers, managers, regulators, students, general public



Dr. Windes has over 35 years' experience in extreme materials research with the majority being in nuclear materials. His material interests range widely from solid oxide fuel cell development to space nuclear propulsion systems to spent nuclear fuel issues. However, his focus for the past 20 years has been in the areas of nuclear graphite and carbon-based composite materials for the new High Temperature Reactor design. As the Advanced Reactor Technologies graphite program technical lead, he has overseen the large Advanced Graphite Creep (AGC) irradiation experiment at INL, developed one of the largest unirradiated nuclear graphite material property databases, is the current chair in developing ASME graphite code, and has numerous interactions with the NRC, international organizations, and commercial HTR vendors on graphite related issues. Dr. Windes holds a doctorate in Material Science from the University of Idaho and a Master and Bachelor in Nuclear Engineering from the University of Illinois and UC Santa Barbara, respectively.

Upcoming Webinars

24 May 2023, Graphite-Molten Salt Interactions, Dr. Nidia Gallego, ORNL, USA

21 June 2023, International Knowledge Management and Preservation of SFR Panel Session Cal Doucette, ARC Energy, Canada; Joel Guidez, retired CEA, France; Hiroki Hayafune, JAEA, Japan; Patrick Alexander, Terrapower, USA; Ron Omberg, PNNL, USA

26 July 2023, Off-gas Xenon Detection and Management in Support of MSR, Dr. Hunter Andrews, ORNL, USA; Dr. Praveen Thallapally, PNNL, USA